D-12g

WASTEWATER FACILITIES PLAN

CITY OF PLUMMER, IDAHO
BENEWAH COUNTY

W Y A T T   E N G I N E E R I N G ,   I N C .

North 1220 Howard Street ✦ Spokane, Washington 99201 ✦ (509) 328-5139 ✦ fax (509) 328 0423

SEPTEMBER 2002

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EQ-Coeur d'Alene
Regional Office

The work product following this signature sheet was prepared under my direction. This work was authorized by the client to provide engineered opinions preparatory to final design. This work is not to be construed as a final design document for any reason by any party.

PROFESSIONAL ENGINEER
REGISTERED
7804
STATE OF IDAHO
ALAN E. GAY

9-30-02

Professional Engineer's License
State of Idaho #7804

Alan E. Gay, P.E.

See Comments 12/4/02

0-129

ENGINEERING • LAND SURVEYING • PLANNING • MATERIALS TESTING

FACSIMILE TRANSMITTAL

TO:	*Gary Gaffney*	**DATE:**	*November 13, 2002*
CO:	*IDEQ*	**PROJ.:**	*Plummer Wastewater*
DEPT:	*Couer d' Alene*	**SUBJ.:**	*Attached Facility Plan Executive Summary*
FAX#:	*208-769-1404*	**W.O.#:**	*685900*

NO. OF PAGES (including this transmittal): 5

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ORIGINAL:

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___ TO FOLLOW VIA:

___ Regular Mail ___ Courier ___ Overnight Service ___ E-mail

MESSAGE:

Gary:
Following is the executive summary for Plummer.
Alan Gay, P.E.

WASTEWATER FACILITIES PLAN, PLUMMER IDAHO
EXECUTIVE SUMMARY

The City of Plummer is an incorporated City situated in northwest Benewah County, approximately 40 miles south of Coeur d' Alene. Access to Plummer is provided by State Highway 95 which joins Highway 5 in Plummer. The community is located on the Coeur d' Alene Indian Reservation with the economy historically being based on forest and agriculture. Major employers are the School District, the Coeur d' Alene Tribe, Pacific Northwest Fiber and the re-tooled lumber mill. Figure 1.1 is a location map showing the City of Plummer in relation to prominent geographic features of the surrounding area.

The town's [redacted] In 20 years, the town's population grew by 62%. With continued expansion of Coeur d'Alene Tribal interests, Plummer expects to continue its growth at a rate of 2.5% annually. The current estimated population in 2002 is 1,040. The projected population in 2022 is 1,700, and by 2028, the design year for the proposed facility, the population is projected to reach 1,977.

The City owns and operates a wastewater collection and treatment system which provides sanitary sewer service to the residents of the City. The effluent from the existing system discharges into Plummer Creek during the winter and spring, and is land applied during the summer. Plummer Creek is a stream with seasonally variable flow which provides the principal drainage for the area. Storage of wastewater is required for the time between land application season and discharge to Plummer Creek. In some years this period can last for two months.

The town has a great deal of inflow to the sewer system caused by stormwater leaking into the sewer collection system through manholes and leaky pipes. This causes more wastewater to flow to the treatment plant than it was designed for. In addition to this deficiency, the treatment plant will soon be required to meet much more strict discharge limits if it continues to discharge to Plummer Creek. Among the most stringent limits will be a very low limit on the amount of phosphorus into Plummer Creek, since phosphorus aids algae growth, which in turn depletes the oxygen available for other aquatic life.

As a result of these factors and an exhaustive analysis of various treatment and discharge alternatives, Wyatt Engineering proposes to help the city meet its wastewater treatment needs in a two phase program. The first phase will involve fixing the leaks in the collection system, and then monitoring sewer flow for a year to determine how effective that fix will be. Following the monitoring, Wyatt Engineering will use the collected flow data to size a new mechanical wastewater treatment plant. This new plant will treat waste to a high enough level for safe application to a wetland. The new treatment wetland will be located in the same area as the current land application system. It will include a pump-back feature to prevent discharge to surface water, including overland flow to Plummer Creek.

The total cost of the improvements is projected to be $5,503,000.

Does a water balance explain
how wastewater will be disposed of? Wetlands ET + seepage?
What makes the engineer think this will work?

I/I

	DATE: 1029/02			
	BUDGET INFORMATION-- CONSTRUCTION PROGRAMS			
	PROJECT	PLUMMER WASTEWATER TREATMENT PLANT I&I REDUCTION		
	COST CLASSIFICATION	**TOTAL COSTS**	**COSTS NOT ALLOWABLE** For participation	**TOTAL ALLOWABLE COSTS** (COL A-B)
1	[redacted]	$ [redacted]		
	Collection System	$ 43,000.00		
	Treatment Plant	$ 132,000.00		
2	Lnds, Right-of-way a;;raisals etc	$ 30,000.00		
3	Relocation expenses			
4	[redacted]	$ [redacted]		
	Collection System	$ 202,000.00		
	Treatment Plant	$ 678,500.00		
5	Other A/Engineering costs IN # 4			
6	Project Inspection Fees IN # 4			
7	Interest on Eng. Fees (1yr @ 5%)	$ 44,000.00		
	Collection System	$ 10,000.00		
	Treatment Plant	$ 34,000.00		
8	Demolition & Removal			
9	[redacted]	$ [redacted]		
	Collection System	$ [redacted]		
	Treatment Plant	$ [redacted]		
10	Equipment			
11	Miscellaneous//CITY COSTS	$ 25,000.00		
12	SUB TOTAL			
13	Contingencies	$ 632,500.00 — 12%		
14	SUB TOTAL	$ 5,503,000.00		
15	Project Income	$		
16	**TOTAL PROJECT COSTS**	$ [redacted]		
	Fed Assistance enter elsigible costs from line 16c X ____ %			

Phase I

AE – 202
Const – 917.5
Admin – 43K
Land – 0
Interest – 10K
1.172.5 + 12% cont. = 1.3M
1.35

Phase II

678.5
2,798.5
132K – 175K
30K
34K
3.673K + 12% = 4.15M

Total

= 4.845.5 + 632 contingencies = 5.5M

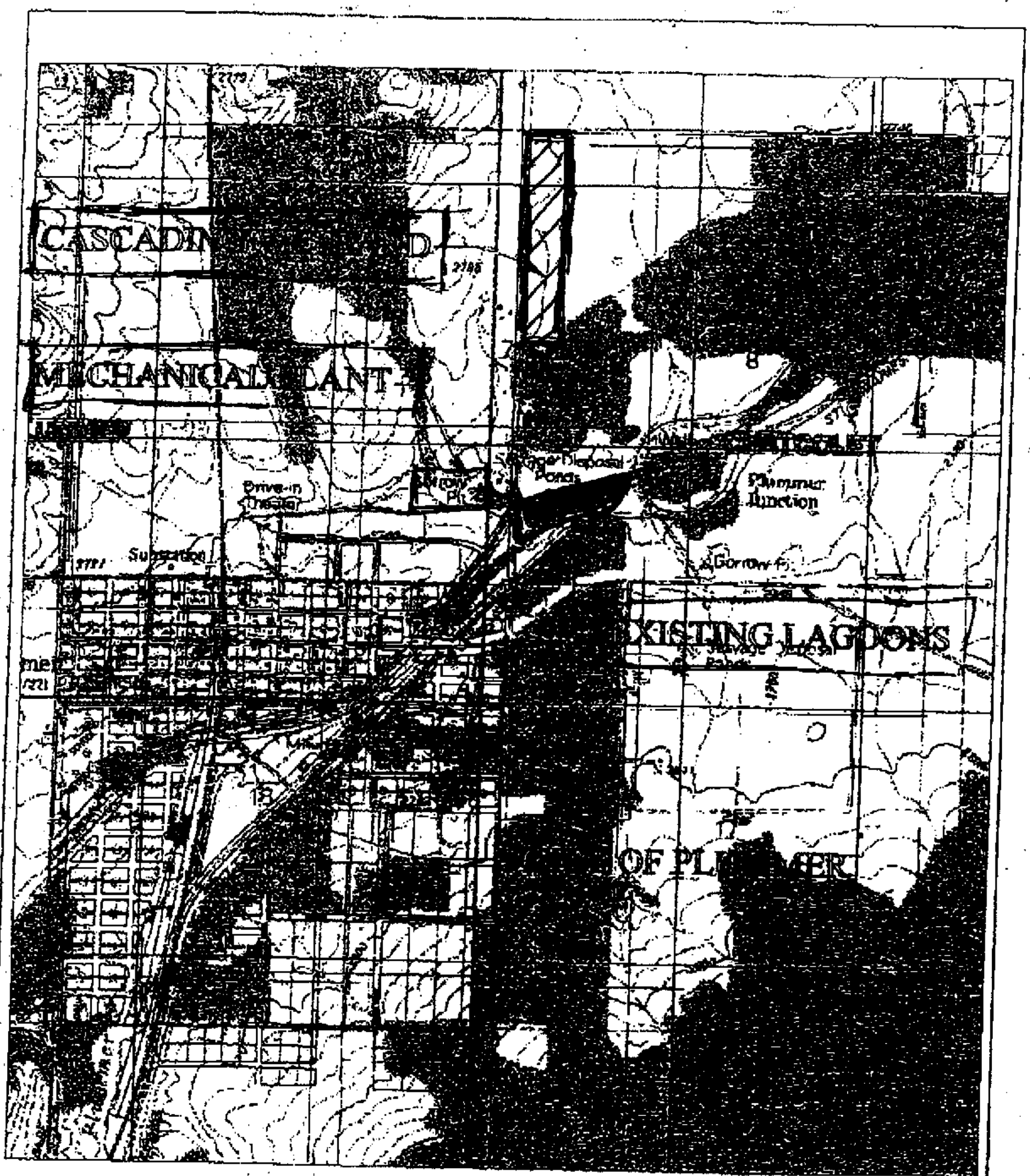


FIGURE 1.1
CITY OF PLUMMER CURRENT LOCATION MAP **SCALE: NA**

Start: 08/01/02
Finish: 01/02/07

Plummer WWTP
07/31/02

Page #1

Task	Duration	Start / Date
Plummer WWTP	1153	08/01/02 – 01/01/07
Piezometer/Install	15	08/01/02
Aerial Mapping	26	10/01/02
FacilityPlanning	44	08/01/02
Facility Plan Review	20	10/02/02
ICDBG Application	68	08/01/03
Water Quality Monitoring	262	08/01/02
Water Quality Limits Set	24	08/15/02
Engineering Est to City	1	09/12/02
Ordinance Calling For Bond Election	1	09/13/02
Bond Election	1	11/05/02
I/I Reduction Design	100	11/06/02
IDEQ I/I Review	20	03/26/03
I/I Bidding & Award	20	04/23/03
USDA I/I Funding Available	1	05/21/03
ICDBG Short List	1	12/17/03
ICDBG Interviews	1	04/22/04
Collection System Construction	138	05/21/03
I/I Monitoring	261	11/03/03
Confirmation of Flows	15	06/29/04
Amend Facility Plan	75	07/20/04
Land Purchase	15	11/02/04
WWTP Design	108	11/02/04
IDEQ WWTP Review	23	04/01/05
WWTP Bidding & Award	20	05/04/05
ICDBG Funding Available	1	06/25/04
USDA WWTP Funding Available	1	08/01/05
WWTP Construction	392	08/01/05
WWTP Start Up	86	09/01/06
WQ Compliance Data	1	01/01/07

Project: Start (Early) Finish (Early); Subproject: Start (Early) Finish (Early); Critical Activity; Non Crit. Activity; Start (Early); Resource Names; Event; Interface Event; Start (Early); Name; Non-Cum. Actual Profile; Non-Cum. Remaining Profile; Non-Cum. Baseline Profile; Cum. Act.+Rem. Profile; Cum. Baseline Profile

From: "Alan Gay" <AGay@uskh.com>
To: <ggaffney@deq.state.id.us>
Date: 11/21/02 12:17PM
Subject: FW: Plummer Questions and Concerns

Gary: Following is the text of an email exchange that I had with Scott Fields. I hope this helps in your review of the Plummer Facility Plan
Thanks,
Alan
-----Original Message-----
From: Alan Gay
Sent: Thursday, November 14, 2002 5:25 PM
To: 'Scott Fields'
Subject: RE: Questions and Concerns

Scott:
Thank you for the very thoughtful questions. We wrestled with many of these in preparing our conceptual design. Where I can answer, I have. Some items will require further study.

Issues with using overland flow filtration at the Plummer WWTP.

1. Ground Water contamination
   a. **¿Will the ground water be contaminated?** No; first, effluent will be treated to advanced secondary level before discharge to the overland flow wetland. Secondly, the nutrient levels will be below 2 mg/L TKN, and below 2 mg/L TP.
   b. Are there any **drinking wells** (currently or planned) in the area that will be affected by the treated waste water entering the water table? No.
   c. Does the **ground water enter** into Plummer Creek? Most likely; our hydrogeologic assessment indicates that this is the case.
   d. How will the **ground water be monitored** for possible pollution associated with this plan? This has not been determined yet; however, we may use the existing lysimeters, and we may supplement those with monitoring wells if necessary; one upgradient and one or two downgradient.
2. Soil permeability
   a. Are the soils on the site permeable enough to accept the design flow of the plan? **Yes!**
   b. If a re-circulation pump is planned in the design does this mean that the engineers are skeptical of the ability of the plan to accept the design flows? **No, the recirculation will improve treatment. There is sufficient permeability in the soil.**
   c. Area residents often have standing water on their land associated only with rainfall and snowmelt. Given this information how do the engineers expect the proposed area to continue to infiltrate significant amounts of water when other adjacent areas will not? There will be more head driving the infiltration. In addition, the use of this land for over twenty years for land application at daily rates in excess of what we are proposing indicates that the existing area is capable of infiltrating at the necessary rate.
   d. How will the plan deal with severe winter weather and the problems associated with icing and soil frosts? There will be subsurface drains located at each berm that will pass water under ice during the winter. These drains will be sized so that there will be sufficient hydraulic head to create ponding.
   e. What will happen during Rain on Snow events which are known to occur at least every 2 years in this area? This will only add 2 to 3" to the total depth of

A lot of the irrigated water is used by crops. (ET) flow in the worst case, because off-site run-on will be prevented by the berms around the area.

3. Nutrient Removal.

a. How will the design deal with long term phosphorus (P) removal once the soils have adsorbed all the P they can? Phosporus uptake by the wetland plants will be continuously remove phosphorus. The plants will be harvested once a year to remove the biomass and nutrients.

b. Will the total P and Nitrogen levels fluctuate seasonally due to temperature related bacteria growth rates. Yes.

4. Over flow contingency.

a. Is there a contingency plan if the overland flow filtration area becomes overwhelmed? There will be equalization ahead of the treatment works. In addition, a potential backup (not in the plan) is to supplement the overland flow with an irrigated drip system in the trees on tribal trust land south of the overland flow area.

b. How will waste water releases be mitigated? Other than the notion that there won't be any, any release would be highly treated even before it reaches the overland flow area.

Thanks again for the questions.
I hope these answers help in your evaluation.
Alan

Pilot the wetlands alternative.

Table of Contents

Tables and Figures

Appendices

The work product following this signature sheet was prepared under my direction. This work was authorized by the client to provide engineered opinions preparatory to final design. This work is not to be construed as a final design document for any reason by any party.

Professional Engineer's License
State of Idaho #7804

Alan E. Gay, P.E.

1.00 INTRODUCTION

The City of Plummer is an incorporated City situated in northwest Benewah County, approximately 40 miles south of Coeur d' Alene. Access to Plummer is provided by State Highway 95 which joins Highway 5 in Plummer. The community is located on the Coeur d' Alene Indian Reservation with the economy historically being based on forest and agriculture. Major employers are the School District, the Coeur d' Alene Tribe, Pacific Northwest Fiber and the re-tooled lumber mill. Figure 1.1 is a location map showing the City of Plummer in relation to prominent geographic features of the surrounding area.

The town's population has grown from 610 in 1980 to 990 in 2000. In 20 years, the town's population grew by 62%. With continued expansion of Coeur d'Alene Tribal interests, Plummer expects to continue its growth at a rate of 2.5% annually. The current estimated population in 2002 is 1,040. The projected population in 2022 is 1,700.

The City owns and operates a wastewater collection and treatment system which provides sanitary sewer service to the residents of the City. The effluent from the system discharges into Plummer Creek during the winter and spring. Plummer Creek is a stream with seasonally variable flow which provides the principal drainage for the area.

The City of Plummer's wastewater treatment and disposal facilities (WWTDF) were designed by H & V Engineering, Inc., in November 1979. The facilities consist of five cells, including two aerated/facultative lagoons, a chlorine contact lagoon, and two sand filters. In August of 1981, Interwest Engineering completed the Wastewater Treatment Facilities Operations & Maintenance Manual for the City ofPlummer. This manual has been the written guidance for operation of the plant since its publication. No other original treatment plant design documents are known to exist.

1.01 Purpose and Scope of Work

The primary purpose of the Plummer Wastewater Facilities Plan is to evaluate treatment alternatives and costs, including re-evaluating the existing facility to assess whether or not it requires an upgrade. The evaluation is to be conducted with the goal of recommending a feasible alternative to treat and dispose of Plummer's wastewater in accordance with State and Federal guidelines and in accordance with the surface water quality goals set by the Coeur d' Alene Tribe. This evaluation will be completed using flow and water quality data compiled in preparing monthly discharge monitoring reports (DMRs) dated since 1993.

1.02 System Description

Plummer's wastewater collection system includes approximately 45,000 linear feet of sewer main (Indian Health Service, 2000), and 398 service connections. Of these, 345 are residential, 50 are commercial, and the remaining three are industrial customers.

The City of Plummer employs a wastewater superintendent and an assistant to maintain its collection system. Collection system piping is primarily 8" concrete and 8" PVC, with some 10" PVC in the lower reaches of the system close to the treatment plant. Manholes are either constructed of precast concrete or brick. Many [illegible], and those placed in gravel roadways have the frame and lid placed below several inches of gravel surfacing to avoid snowplow damage during the winter.

The sewer discharges from the west and south into a single manhole located immediately west of the entrance to the WWTDF just northeast of the intersection of Seltice Avenue and Pine in the northeast corner of the City. Wastewater flows from that manhole to the east into the headworks of the WWTDF, just ahead of the first cell of the plant. Figure 1.2 depicts the City's existing wastewater facilities.

The headworks, a concrete structure with two flow channels, includes a comminuter in one channel and a Miltronics flow meter in the other channel. The flow meter is equipped with a continuous data recorder.

1.03 Regulatory Framework

In May, 2002, the City of Plummer received a compliance order issued by the Environmental Protection Agency's Region 10 Water Quality program. This compliance order required that the City of Plummer complete its inflow and infiltration (I&I) removal program **by December 31, 2004**, and comply with the water quality standards in its NPDES permit by that same date. On August 20, 2002 the compliance order was revised by EPA. It now states that I&I is to be removed by December 31, 2004, and the WWTDF is to be in compliance with the percentage removal requirements in the NPDES permit by **January 1, 2007.**

This facility plan is being prepared for review and acceptance by the Idaho Department of Environmental Quality (IDEQ). IDEQ also issues and has jurisdiction over the Wastewater Land Application Permit (WLAP) for the City's WWTDF. IDEQ's review of this facility plan will be made using what are commonly referred to as the "Ten State Standards", a set of engineering standards for wastewater facilities compiled by the Great Lakes-Upper Mississippi River Board of State and Provincial Public Health and Environmental Managers.

Water quality criteria, if necessary, are being set by the Water Resource Program of the Coeur d' Alene Tribe. Once criteria are developed, they will be forwarded for review by the EPA's Region 10 Water Quality program. EPA will develop the next NPDES permit and fact sheet based on the Coeur d' Alene Tribe's water quality criteria.

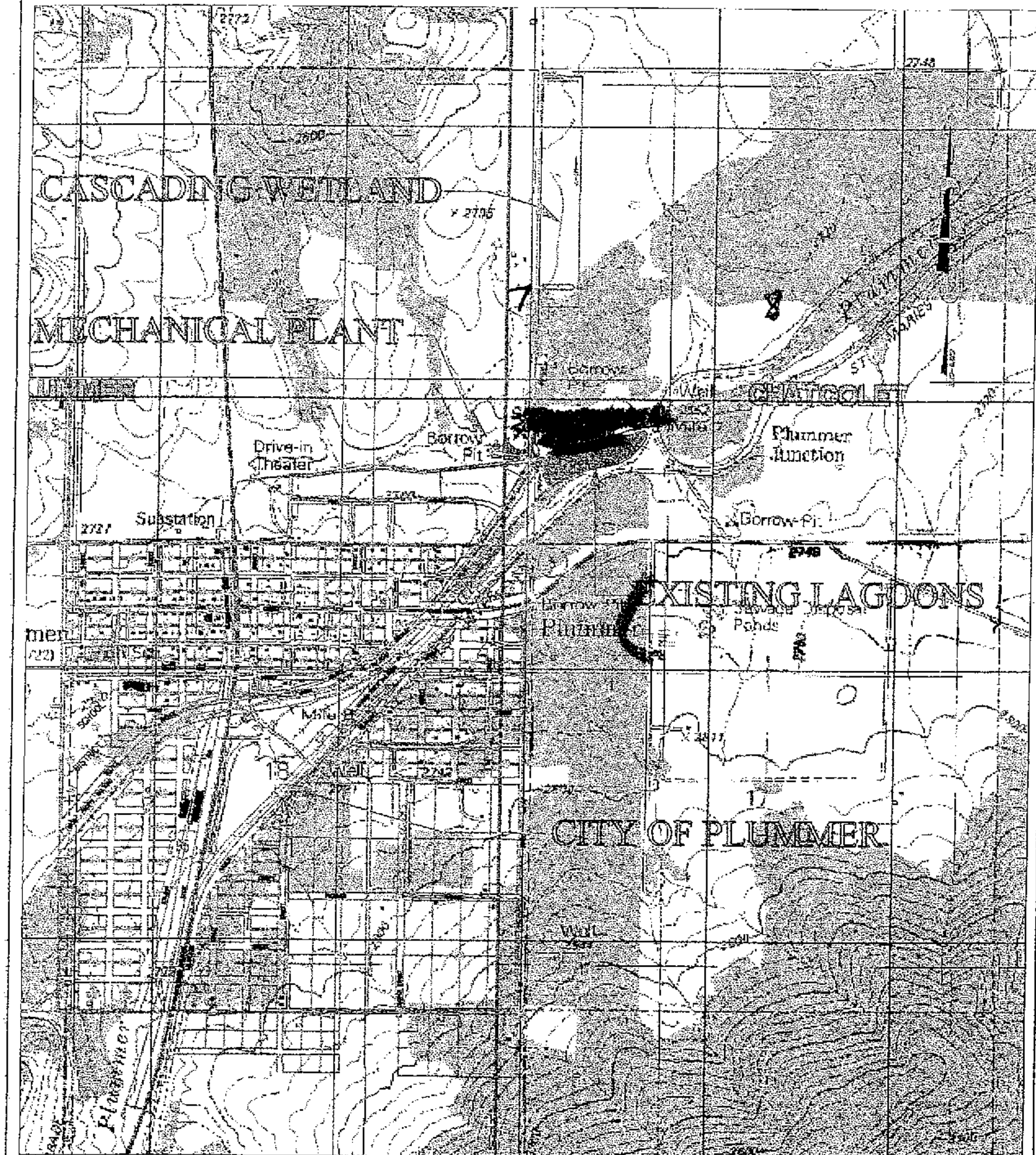


FIGURE 1.1
CITY OF PLUMMER CURRENT LOCATION MAP **SCALE: NA**

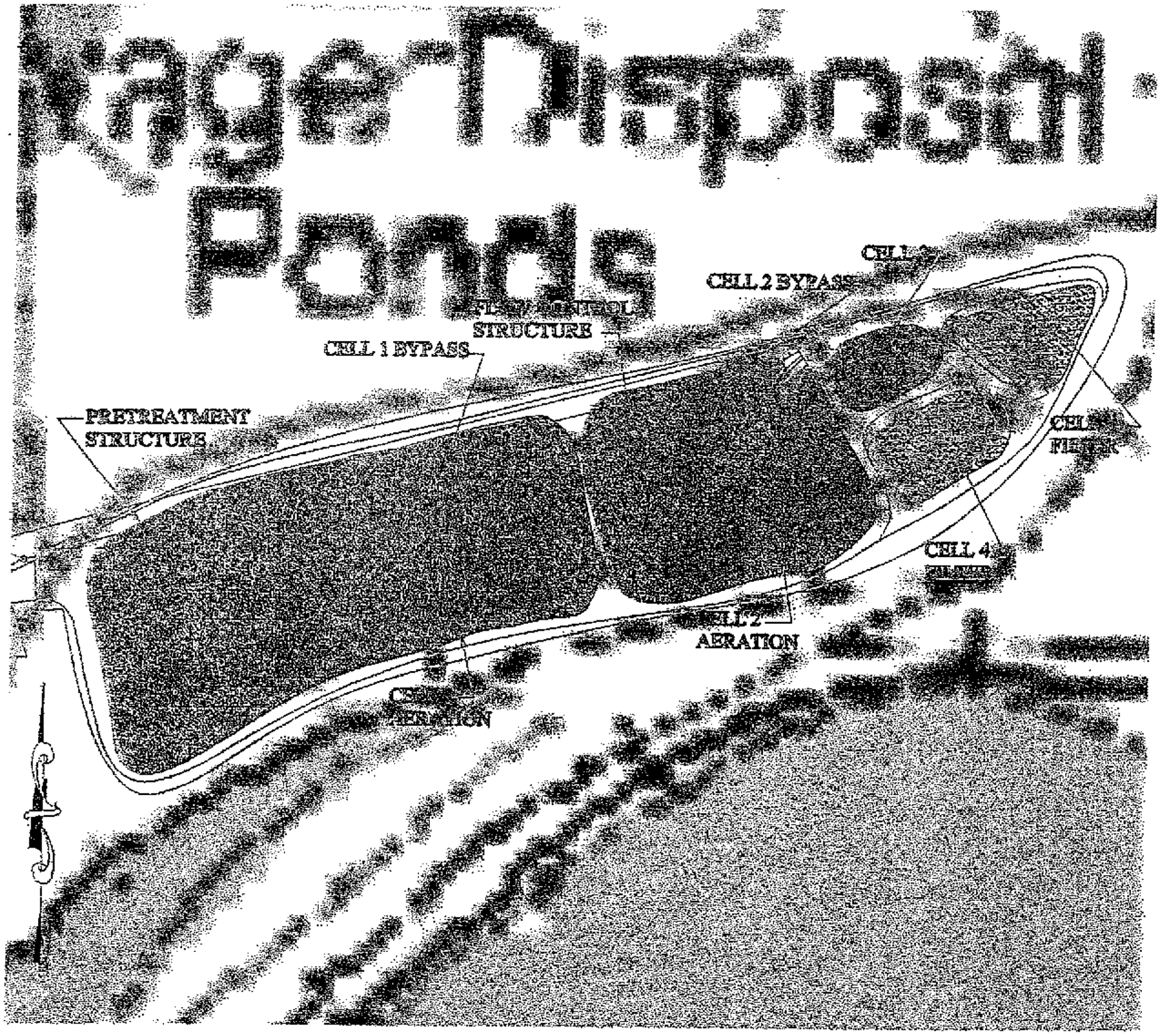


FIGURE 1.2
CITY OF PLUMMER EXISTING SEWER TREATMENT PLANT **SCALE: NA**

2.00 BACKGROUND INFORMATION

2.01 Geologic Setting

The major geologic formations in the Plummer area include the Pre-Cambrian Striped Peak Formation, Miocene Columbia River Basalt, the Miocene Latah Formation, and the Quaternary Palouse Formation. The Plummer Creek watershed creek bottom land is mapped as Miocene and possibly Oligocene sediments. The hills in the northern and western portion of the land application site to the northeast of the City are mapped as the upper member of the Wallace Formation of the Pre Cambrian Belt Supergroup.

The surficial geology in the middle elevations between the hilly uplands and the creek lowlands is the Pleistocene Palouse Formation, composed of loess soils. These soils exhibit high water storage capacities and some Holocene ash layers which may increase water retention.

The existing and proposed land application areas lie wholly within creek bottom lands mapped as Miocene and Oligocene sediments. This formation is described as deeply weathered orange to yellow silt and clay, with pebbles and sand in some areas, overlying Columbia River Basalt (within the land application area). The typical thickness is 30'. Refer to Figure 2.1, Geologic Map, showing the WWTDF vicinity.

2.02 Soil Conditions

The predominant soils in the vicinity of the City are [redacted] near the surface, and [redacted] loams from 30 to 60 inches below the ground surface. The silty clay loams are approximately ½ clay, with much of the area subject to frost action and [redacted] that may contribute to infiltration and inflow problems in the sanitary sewer collection system.

The soil in the vicinity of the treatment plant is somewhat more permeable, including stony clay loam and shallow unweathered bedrock. (USDA SCS, 1980)

2.03 Local Hydrogeology

As required by the Department of Environmental Quality, a hydrogeologic study was performed by Wyatt Engineering, on August 27, 2002. This study is intended to partially address Receiving Water Study Requirements under the City of Plummer's NPDES Permit ID-002278-1. This study, the text of which is included [redacted] concludes that it is possible that the clay in the land application area soil is sufficient to seal off deeper groundwater underlying the land application area from surface irrigation. From all that is known of the local stratigraphy and groundwater elevations, it appears that the direction of groundwater flow under the land application area is southeast toward Lake Chatcolet.

Piezometer monitoring at the land application site will be necessary to verify the elevation of shallow ground water at that site. The shallow water table is most likely responsive to runoff from both precipitation and irrigation. The [redacted] most likely discharges to Plummer Creek via the north bank of the creek in the vicinity of the existing WWTDF lagoons.

2.04 Surface Hydrology

As part of the monitoring of Plummer Creek, stream flow data is being recorded to not only correlate with water quality data, but also to characterize the surface water hydrology of the drainage basin above the wastewater treatment facility. The area draining toward Plummer Creek above the WWTDF includes approximately [redacted]. The surfaces include approximately [redacted] acres of impervious surface, primarily in the City of Plummer and Highway 95. In addition, approximately 4,900 acres are forested, 2,340 acres are agricultural, 35 acres are graveled, 380 acres are undeveloped [redacted] and 100 acres are developed as pervious surfaces such as lawns and landscaped areas.

Using a basic watershed model (SCS TR55 Method), Wyatt Engineers was able to simulate a [redacted] return frequency [redacted] that approximates recorded discharges in December, 1998.

Site 1, 3, 4, who owns?

2.05 Service Area

The service area for the WWTDF includes the incorporated area of the City of Plummer, plus contracted service for the Riley Creek Mill, Pacific Northwest Fiber, and various services to the Coeur d' Alene Tribe and its agencies in the area immediately northwest of and adjacent to the City limits. Figure 2.2 shows the zoning for the City of Plummer.

2.06 Land Ownership and Availability

1

The area around and including the existing WWTDF facilities is owned by several different entities. The more northerly area of the lagoons, chlorination and filtration facilities is leased by the City from Coeur d' Alene Tribe members who hold tribal allotments. The lease is administered through the Coeur d' Alene Tribe. The City leases the remaining southerly portion of the plant site from the Union Pacific Railroad. Multiple ownership of the existing lagoon site has made it difficult for the City of Plummer to make practical long-range decisions affecting the property. This has made ownership of nearby property more attractive for siting a new treatment facility.

The land application portion of the WWTDF is owned by the U.S. EPA in trust for the City. The area adjacent to the west side of the existing land application area is currently Coeur d' Alene tribal allotment land owned by several individual tribe members. This area is now under tribal control, and the ownership status is very similar to that of the existing wastewater treatment lagoon facilities.

Site

Potential areas for new facilities include the land immediately to the west of the existing lagoons across Leitz Road. This area is owned by the State of Idaho for use by the Idaho State Department of Transportation as a gravel pit. The readily accessible gravel has already been mined from the pit, leaving a large flat area that is suitable for a mechanical wastewater treatment facility.

Another potential area for a new treatment facility is located just to the south of the above-mentioned gravel pit. Two adjacent lots bounded by Leitz Road on the east, a tributary to Plummer Creek on the north, and Pine Street on the south were for sale at the time that this facility plan was under preparation (September, 2002). These two lots together may be suitable for a wastewater treatment facility, although grading work and possibly soil stabilization work site would be necessary for a plant located on what are now the two private lots.

Site

2.07 Population Analyses

There are currently 345 residential services (2000), and 53 commercial and industrial services in the City of Plummer service area. Based on water usage figures supplied by the City of Plummer, the 53 commercial and industrial services are equivalent to 100 residential services. This yields a total of 445 equivalent residential units (ERUs).

Based on the population growth trend since the 1980 U.S. Census, it is reasonable to project the following growth for the City of Plummer over the 20 years that the new plant will be in operation:

	Year	Population	ERUs
186	1980	610	248
	1990	796	359
194	1993	857 (est.)	387 (estimate)
	2000	990	436
	2002	1040 (est.)	445
	2008	1206 (est.)	516 (estimate)
	2028	1977 (est.)	846 (estimate)

2

The Coeur d' Alene Tribe plans to develop 80 acres of tribal land to the northwest of the intersection of Highway 95 and Highway 5, just outside the existing city limits. This area of mixed-use development, commonly referred to as the Celebration Grounds, is projected to contribute 50,000 gallons of wastewater per day. The tribe has indicated that it wishes to reach an agreement with the City of Plummer for the City to accept this flow.

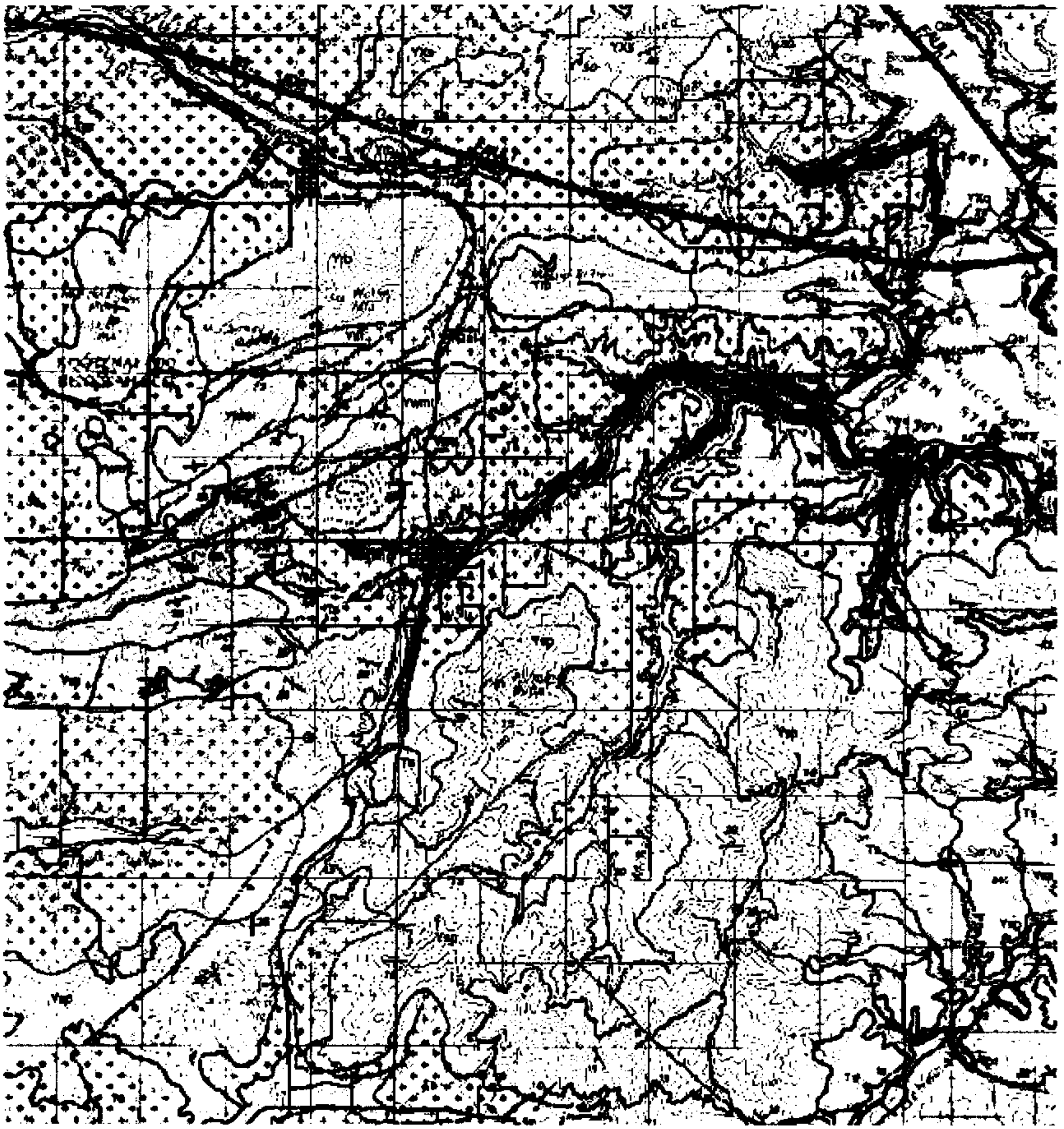


Figure 2-1 Geologic Map Showing WWTDF Vicinity

Worthless

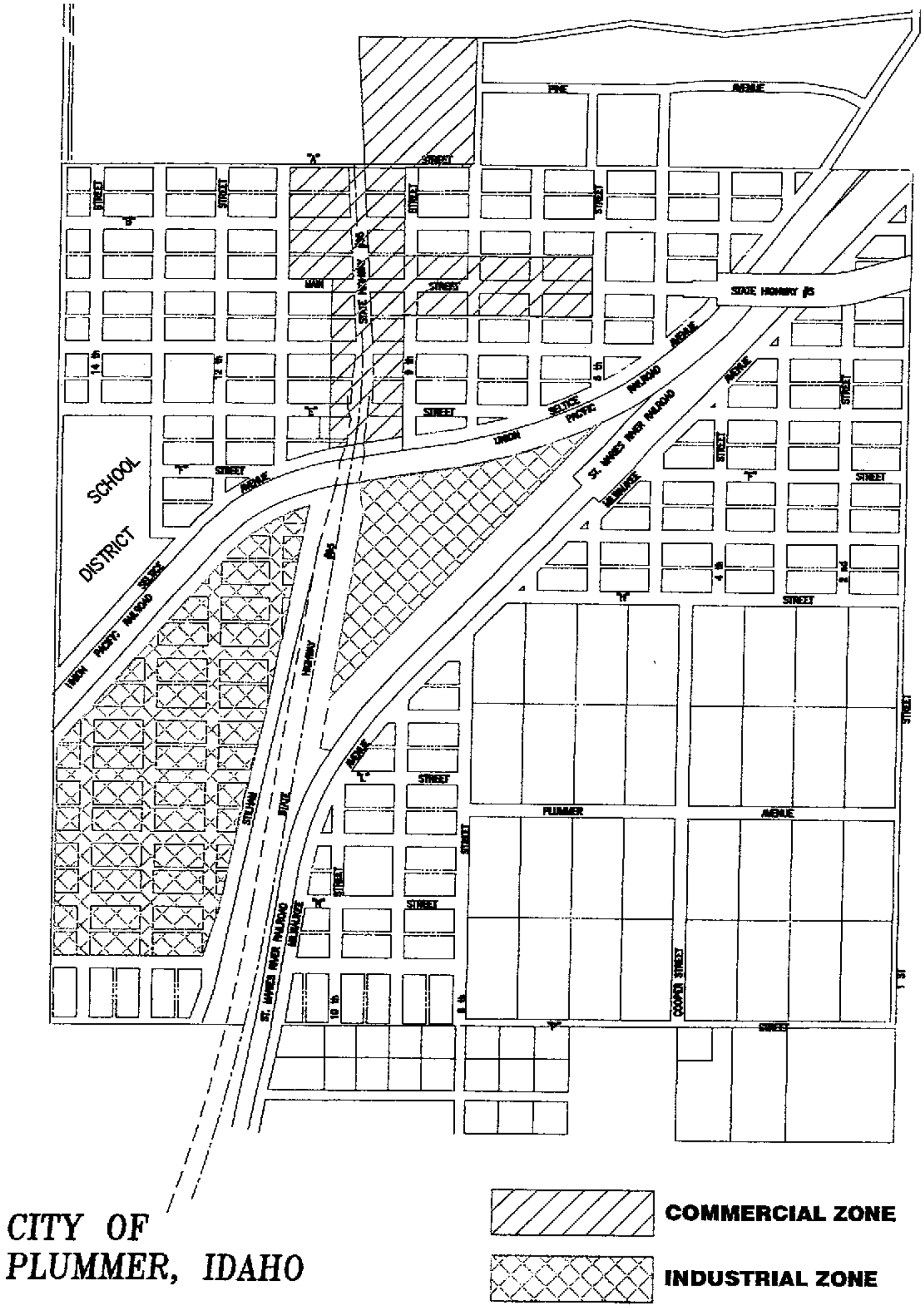


FIGURE 2-2
CITY OF PLUMMER CURRENT ZONING MAP

SCALE: 1"=1000'

3.00 INFILTRATION AND INFLOW ANALYSIS

3.01 Introduction

EPA Guidelines regarding excessive I&I state that if the average dry weather flow is less than 120 gallons per capita per day (gpcd), no further infiltration analysis work is required.

Based on 990 residents (2000 U.S. Census data), the maximum dry weather flow recommended by EPA guidelines would be 118,800 gallons (990 x 120 gpcd). Assuming constant growth towards 1,977 residents in 2028, the 2002 population is 1,040. With 1,040 residents, the maximum dry weather flow may be 120 gpcd, equivalent to 124,800 gallons (1,040 x 120 gpcd).

Flow data indicates that the minimum dry weather flow in Plummer is approximately 50,000 gallons per day (gpd) and that maximum dry weather flow is approximately 150,000 gpd. The [redacted] (December 8, 2001).

Based on this flow data, it was determined that [redacted] was entering the Plummer Sewer System, primarily from wet weather inflow. The area contributing inflow has been tentatively identified and an I&I removal project has been recommended by Indian Health Service. This project is scheduled for design and construction within the next twelve months. Following construction, the collection system will be monitored for twelve months to determine the success of the I&I removal project.

3.02 Flow Monitoring

The influent flow monitoring data was gathered between [redacted] Summary charts of the flow data are included in Appendix II.

The selected time period includes dry weather periods in the summers and falls of 1999 through 2001. Monitoring continues as part of the operation of the wastewater treatment facility and to continue monitoring higher flows which may correlate to I&I.

How accurate?

The flow monitoring uses a permanent flow meter installed in the influent flume in the headworks prior to wastewater entry to the treatment lagoons. The flow meter is a Miltronics flow meter, which uses an ultra-sonic (US) sensor.

Flow rates are calculated using the known correlation between the depth of flowing water over the "throat" of the flume and the number of cubic feet per second that flow through the flume at that depth. The table of depths and the correlating flow rates are programmed into the memory of the flow meter.

Data is gathered continuously and then averaged over a one minute interval. After one minute, the data is logged into the flow meter memory.

The data is recorded using the totalizer feature of the flow meter on a daily basis. This data is then recorded by hand onto the daily record for the treatment facility.

Appendix II contains data from the flow monitoring station in a tabular format.

3.03 Flow Monitoring Conclusions

In general, the flow monitoring data shows that there is very little dry weather infiltration, and that a great deal of wet weather inflow and infiltration was removed with the construction of the sewer collection system improvement project in 1996-1998.

Seasonal storms still appear to contribute to elevated inflow rates during the months of November through June. The information in Table 3-1 would indicate that I&I has not been significantly reduced about from the flows recorded in 1993. However, water quality data indicates otherwise, as explained further in this section. ?

3½ yrs.

how determined?

Table 3-1 Recorded Average Monthly Flows to Existing Treatment Facility

Month	Year	Avg. Flow (mgd)*	Avg. I&I (mgd)
January	1993	0.146	0.059
February	1993	0.117	0.030
March	1993	0.103	0.016
April	1993	0.087	0.000
May	1993	0.099	0.012
June	1993	0.081	0.000
July	1993	0.130	0.043
August	1993	0.080	0.000
September	1993	0.080	0.000
October	1993	0.080	0.000
November	1993	0.083	0.000
December	1993	0.129	0.042
1993 Overall Averages		**0.101**	**0.017**

Month	Year		Avg. Flow (mgd)*	Avg. I&I (mgd)
July	2001	.130	0.079	0.000
August	2001	.080	0.072	0.000
September	2001	.080	0.068	0.000
October	2001	.080	0.076	0.000
November	2001	.083	0.072	0.000
December	2001	.129	0.202	0.101
January	2002	.146	0.143	0.042
February	2002	.117	0.128	0.027
March	2002	.103	0.137	0.036
April	2002	.087	0.077	0.000
May	2002	.099	0.055	0.000
June	2002	.081	0.058	0.000
2001 - 2002 Overall Averages			**0.097**	**0.017**

Base Flow

High I/I

The information in Table 3-1 provides a long-term view of the monthly flow trends in the City's collection system following collection system improvements made between 1996 and 1998. As can be seen from the data in Table 3-1, the months of January through April include relatively high average flow rates. This is due to high peak flow events, which still result from inflow to flow to the collection system. The base flow rates are lower than those in 1993, though the population has increased by over 10 percent.

Proposed improvements to the wastewater treatment facilities will require hydraulic and treatment process sizing in accordance with flow data in Table 3-1. In addition, the portion of the treatment plant designed to handle influent flows must be sized to handle anticipated peak wastewater flow rates. The peak recorded daily flow rate for each of the monitored months was used to compile Table 3-2. **The highest non-anomolous peak flow event was a 406,000 gpd flow, occurring on January 27, 2002.**

Table 3-2 Recorded Monthly Peak Flows to Existing Treatment Facility

Month	Year	Average Flow (mgd)*	Peak Day Flow (mgd)
January	1993	0.146	0.150
February	1993	0.117	0.150
March	1993	0.103	0.150
April	1993	0.087	0.130
May	1993	0.099	0.130
June	1993	0.081	0.100
July	1993	0.130	0.300
August	1993	0.080	0.080
September	1993	0.080	0.080
October	1993	0.080	0.080
November	1993	0.083	0.100
December	1993	0.129	0.300
Overall Peaks		**0.146**	**0.300**

Inflow sources? / Service line work?

Table 3-2 (Continued) Recorded Monthly Peak Flows to Existing Treatment Facility

Month	Year	Average Flow (mgd)*	Peak Day Flow (mgd)
July	2001	0.079	0.107
August	2001	0.072	0.085
September	2001	0.068	0.080
October	2001	0.076	0.132
November	2001	0.072	0.242
December	2001	0.202	0.840
January	2002	0.143	0.406
February	2002	0.128	0.397
March	2002	0.137	0.316
April	2002	0.077	0.196
May	2002	0.055	0.420
June	2002	0.058	0.122
Overall Peaks		0.202	0.840

The peak flow rate recorded on December 6, 2001, is considered to be an anomaly. That flow rate is significantly greater than any other recorded flow rate since 1993. The next highest flow rate occurred January 29, 1998, at a rate of 0.477 mgd. There are other instances of flow over 0.400 mgd recorded since 1993. **However, based on the quality of the data and the correctable sump conditions connected with the highest flows, 377,000 gpd was selected as the highest peak flow rate under the present conditions.** Why?

3.04 Corrective Actions

The average wastewater flow rate over the recently recorded period is under 120 gallons per capita per day, but it may be cost-effective to construct additional collection system piping and manhole improvements as a means of reducing the significant wet -weather-related inflow shown in Table 3-2. This is because the peak storm water inflow rate is significantly greater than the average daily flow, and impacts the treatment plant's capacity and ability to meet water quality standards. High flow rates dilute the influent flow, lowering the concentration of organic and solids. At high flow rates, the plant is not capable of achieving the required removal percentages for organic material and solids prior to discharge to Plummer Creek. As a result, this facility plan includes recommendations for an inflow removal program to reduce peak wet-weather flow rates. There is no assurance that additional inflow reduction can be achieved. Therefore, based on the available information, and assuming that no further I&I reduction is likely, we will use 200,000 gpd for in-town generated flow and 50,000 gpd of projected flow generation from the Coeur d' Alene Tribe's Celebration Grounds. This results in a total design flow of 250,000 gpd. This is an increase of 150,000 gpd above the existing flow rate. Adding 150,000 gpd to the existing peak flow for the new treatment system, a peak flow of 527,000 gpd was derived. This is equivalent to an average daily wastewater flow of 126 gpcd based on the 2028 estimated population of 1977, or 101 gpcd if the projected flow from the Celebration Grounds is not included in the gpcd calculation.

Average Daily Design Flow: 126 gpcd

3.05 Design Loading

The sewage flow forecast for Plummer is for a 6-year and a 25 to 30-year projection. Most of the demand will be from single family residences, but there is projected to be a significant percentage from non-residents and commercial sources.

We assume that a 2.5% annual population increase toward the total projected for 2028 (1977) will occur during the next six years, so that the projected population in 2008 would be 1206. At that time, assuming a flow rate of 101 gpcd for additional residents, the average daily flow will be approximately 121,800 gpd. 101 gpcd for new connections is a reasonable assumption because of the likely manhole sump condition origin of the existing high wet-weather inflow. Using the same assumption, the projected total population of 1977 would result in a 2028 flow rate of 200,000 gpd, 250,000 with Celebration Ground flows.
Table 3-3 showing the Projected Wastewater Flow Forecast was derived using the formula:

Average Daily Sewer Flow Forecast
= Existing Flow +(Average Daily Demand) x (new residents) + Celebration Ground Flow
= 97,000+(101 gpcd x 987)+50,000 ≈ 250,000 gpd

90%?

Table 3-3 Projected Average Wastewater Flows

Year	Projected Population	Wastewater Flow, gpd
2002	1,040	105,400
2003	1,066	107,700
2004	1,093	110,400
2005	1,120	113,100
2006	1,148	115,900
2007	1,177	118,800
2008*	1,206	171,800
2028*	1,977	250,000

*These figures include 50,000 gpd for the Coeur d' Alene Tribe's Celebration Grounds.

4.00 Design Criteria

4.01 Introduction

The design criteria in this report is summarized in this section.

Average Daily Flow: The average amount of wastewater effluent treated and disposed of during one 24-hour period.

Effluent Quality: The treated effluent quality (prior to discharge) must conform to guidelines set forth by the State of Idaho and/or the Coeur d' Alene Tribe.

actually EPA

Land Application: Wastewater that is applied directly to the ground, either above or below ground surface, must meet groundwater quality standards set forth by the State of Idaho.

Based on the conclusions of the geotechnical study undertaken for this project, the engineer believes that a shallow perched water table condition is likely to develop under natural conditions in the soils beneath the site. Accordingly, it is concluded that some drainfield or wetland effluent infiltrating to the silt layer would probably flow across the shallowest clay lense. Flow moving across this clay lense would eventually discharge through soil pores to a possible unconfined shallow perched aquifer above the primary drinking water source aquifer for the City of Plummer.

A copy of this study is in Appendix III.

not complete

Design and Construction Standards: The design engineer will furnish plans and written specifications outlining the materials to be used, the installation procedures, and any required testing procedures. The materials, installation and required testing will be consistent with that commonly used for wastewater facilities and systems, and will conform to all requirements outlined in IDAPA 58.01.02, 58.01.03, and 58.01.17 regarding design and construction of sewage works, on-site sewage systems, and land application systems, respectively.

4.02 Wastewater Flow and Loading

The City of Plummer population has increased steadily from 610 in 1980 to its present population of approximately 1040 in 2002. Since 1990, the population has been growing at a rate of approximately 2.5 percent per year. The following presents historical population data for the City:

Year	Population
1930*	469
1940*	539
1950*	454
1960*	444
1970*	458
1980	610
1990	796
2000	990 (U.S. Census)
2002	1040 (estimate)

*Figures prior to 1980 are based on Benewah County data.

As discussed previously, wastewater flow rates at the treatment facility have been measured constantly since at least January, 1993. A flow meter is installed in the headworks of the wastewater treatment facilities to determine flow rates. Measured flow rates ranged from 0.05 MGD to 0.30 MGD over the first study period from January 1, 1993 through December 31, 1993. Measured flows ranged from 0.002 mgd to 0.840 mgd over the second study period, from January how?

1, 1999, through June 30, 2002. The average daily flow rate for 2002 was determined to be 0.097 MGD in Section 3, with approximately 17%, or 0.017 MGD, determined to be I&I. As a result of the flow monitoring discussed in Section 3, the design criteria for flow has been established to be 97,000 gpd for present flows, and 250,000 gpd for ultimate flow in 2028.

25x

Loading characteristics are measured daily as part of the Discharge Monitoring Reporting requirements for the facility. Table 4-1 presents the analytical results of that sampling. The data in Table 4-1 was selected to correspond with the data in Section 3 on flow data.

Table 4-2

Table 4-1 1993 and 2001 Wastewater Analysis Results

Permit max

Parameter		1993 Average	2001-2002	2001 Peak	
BOD[1]	in	71 mg/L	157 mg/L	337 mg/L	
	out	11 mg/L	11 mg/L	20 mg/L	30
TSS[2]	in	119 mg/L,	156 mg/L	367 mg/L	
	out	17 mg/L	14 mg/L	30 mg/L	30
fecal c.[3]	in	No test	No test	No test	
	out	79/100 mL	8/100 mL	300/100 mL	100
flow	in	0.101 mgd	0.097 mgd	0.840 mgd	0.1

1. BOD = Biochemical Oxygen Demand (5-day), based on the arithmetic mean of samples taken.
2. TSS = Total Suspended Solids, also based on the arithmetic mean of samples taken.
3. Fecal C. = Fecal Coliforms, reported in the number of colonies detected per 100 milliliter sample. The average values are the geometric mean.

As noted in Section 3, by 2001 average daily flow had increased to approximately 97,000 gallons/day. At the same time, influent concentrations of constituents increased significantly. The increase in average influent concentrations indicates that the I&I reduction program effectively reduced "clean water" flows to the sewer system. Some improvement was made in the treatment efficiency of BOD, but not enough of an improvement to offset occasional wet-weather inflow-caused reductions in removal efficiency. These reductions in removal efficiency have caused the facility to miss it's 1982 NPDES permit limits.

4.03 Wastewater Disposal System Improvements Criteria

The existing disposal system involves storage, evaporation, land application, and seasonal discharge to an intermittent stream. The existing wastewater treatment plant consists of two aerated facultative lagoons which were designed and constructed between 1979 through 1981. At the time they were constructed, the lagoons were intended to function as aerated facultative lagoons, using aeration to enhance biological activity in the wastewater with a long enough retention time to allow microbes to partially digest the biological matter in the wastewater. As the town has grown, flows have become progressively greater, inflow continues to introduce flows greater than the facility is able to treat, and the facility has discharged effluent to Plummer Creek that did not meet permit limits.

Not true

Discharge to Plummer Creek is limited by stream flow as well as permit limits. Based on discussions with the Coeur d' Alene Tribe's Water Resource Program Manager, Mr. Scott Fields, it is very likely that water quality based limits will be imposed on future discharges to Plummer Creek, especially phosphorus limits. It is also likely that other water quality parameters will become lower, including biochemical oxygen demand, total suspended solids and restrictions on the discharge of chlorine. Discharge to Plummer Creek is usually feasible between mid-November and mid-May. From mid-May to mid-November, the creek has a flow rate below ten times the average daily discharge from Plummer's treatment facility and is therefore too low to allow discharge.

Discharge to a conventional land application system such as the one currently in use by the City of Plummer is seasonally restricted to the needs of whatever crop is in use. In Plummer's case, through the 2002 growing season, that crop was oats. While oats requires a high liquid loading early in the summer, the required loading is greater than the City's existing pumps can deliver during five standard eight-hour shifts. The harvest date of oats is September at the latest, which means land application must cease in early September each year. Therefore, the City will switch to cropping alfalfa with the 2003 growing season to extend the period available for land application. Once the switch is made to cropping alfalfa on its land application area, the City will be able to land apply wastewater through early October.

Due to the gap between either end of the land application season and either end of the feasible period for discharging to Plummer Creek, continuing to utilize a combination of these discharges will require an equalization storage basin.

yes

The ideal discharge alternative will allow for year-round discharge with minimal equalization of flows resulting from high inflow or disruptions in the discharge schedule. Potential year-round discharges include subsurface disposal, leaky wetlands, and overland flow.

The 1982 National Pollutant Discharge Elimination System (NPDES) permit outlines the following limits.

Table 4-2 1982 NPDES Permit Effluent Limitations

Parameter	Average Monthly	Average Weekly
BOD[1]	30 mg/L, 85% removal, 26 lb/day	45 mg/L, 85% removal, 39 lb/day
TSS[2]	30 mg/L, 85% removal, 26 lb/day	45 mg/L, 85% removal, 39 lb/day
Fecal Coliform	100#/100 mL	200#/100 mL
Flow	0.100 mgd	0.200 mgd
	No discharge from May 1 to November 30	
pH	Daily minimum >=6.5, Daily maximum <=9	

1. BOD = Biochemical Oxygen Demand (5-day), based on the arithmetic mean of samples taken.
2. TSS = Total Suspended Solids, also based on the arithmetic mean of samples taken.
3. Fecal coliform limits are based on the geometric mean.

All flows

These limitations expired in 1987, but have been administratively extended by EPA Region 10. From July 2001 through June 2002, the following excursions beyond permit limits were recorded:

Table 4-3 2001-2002 NPDES Permit Violations

Date	*Parameter*	*Limit*	*Actual Discharge*	*Unit*
Dec. 2001	Monthly Avg. Flow	0.100	0.202	mgd
Dec. 5-14 2001	Weekly Avg. Flow	0.200	0.202 - 0.531	mgd
Jan. 2002	Monthly Avg. Flow	0.100	0.143	mgd
Feb. 2002	Monthly Avg. Flow	0.100	0.128	mgd
Feb. 24-26 2002	Weekly Avg. Flow	0.200	0.210 - 0.219	mgd
Mar. 2002	Flow	0.100	0.137	mgd
Mar. 24-29 2002	Weekly Avg. Flow	0.200	0.200 - 0.243	mgd
Apr. 2002	% removal, TSS	85%	73%	%

Due to dilute inflow

The above table illustrates that the primary problem with the existing facility is a lack of hydraulic capacity. With average weekly flows as high as 0.531 mgd, the existing facility simply can not keep discharges within permit limits. The high flows at the end of March 2002, for example, caused flow rate permit violations, and later a violation of percentage removal requirements in April 2002 for total suspended solids.

Under the Compliance Order issued by Region 10 of the EPA on April 26, 2002, the 1982 permit limitations were to be met by December 31, 2004. However, the EPA was persuaded to reissue the Compliance Order on August 20, 2002. The revised compliance order requires that the City of Plummer remove inflow and infiltration by December 31, 2004, and achieve the required

Remove I/I to get compliance

Need EPA agreement with these

percent removal for BOD and TSS by December 31, 2004. The City's wastewater treatment facility has until January 1, 2007 to achieve the other water quality requirements in the NPDES permit.

As discussed in Section 2, the anticipated flows following build-out are expected to be 250,000 gpd, or 126 gpcd. Since the current system does not meet the effluent limitations specified in Table 4-2 while treating wastewater for the existing population of 1040 people, and the build-out population is significantly greater than 1040 residents, the treatment facility alternatives discussed in Section 6 must consider alternative disposal methods.

draft

The Idaho Department of Environmental Quality has issued a Municipal Land Application Permit No. LA-000004-02 to the City of Plummer. This permit is to take effect in the 2003 growing season, beginning May 1 and ending on October 31. Table 4-4 illustrates the discharge parameter limitations under the Land Application Permit.

Table 4-4 Land Application Standards / Proposed Points of Compliance

Parameter	Maximum Contaminant Level	Proposed Point of Compliance
Total Coliform	230#/100 mL until August 1, 2004 23#/100 mL thereafter	End of Pipe
COD	50 lbs/acre/day	End of Pipe
N	150 lbs/acre/day	End of Pipe
P	27 lbs/acre/day	End of Pipe

EPA duty

The Coeur d' Alene Tribe's Water Resource Program Manager, Mr. Scott Fields, has discussed potential permit limits for Plummer Creek should the WWTDF continue seasonal discharges to the creek. Table 4-5 is based on these discussions. The information in Table 4-5 is not currently in a discharge permit, but will likely be part of a future NPDES permit should the City of Plummer continue to discharge to Plummer Creek.

written anywhere?

Table 4-5 2002 Proposed Permit Effluent Limitations, Discharge to Plummer Creek

Parameter	Average Monthly	Average Weekly
BOD[1]	20 mg/L, 85% removal, 42 lb/day	30 mg/L, 85% removal, 63 lb/day
TSS[2]	20 mg/L, 85% removal, 42 lb/day	30 mg/L, 85% removal, 63 lb/day
DO[3]	6.0 mg/L	
Fecal Coliform[4]	100#/100 mL	200#/100 mL
TP[5]	0.25 mg/L	0.50 mg/L
Flow	0.500 mgd Peak Daily, 0.250 mgd Average Monthly; Flow-paced discharge from Nov.15 to May 15.	
pH	Daily minimum >=6.5, Daily maximum <=9	

Now meets
ok
OK
?
OK
?
why?

1. BOD = Biochemical Oxygen Demand (5-day), based on the arithmetic mean of samples taken.
2. TSS = Total Suspended Solids, also based on the arithmetic mean of samples taken.
3. DO = Dissolved Oxygent
4. Fecal coliform limits are based on the geometric mean.
5. TP = Total phosphorus.

This document has been prepared assuming that a treatment facility discharging to Plummer Creek must meet the discharge criteria outlined in Table 4-5.

As discussed in Section 2, the anticipated flows following build-out are expected to be 250,000 gpd, or 126 gpcd. Since the current system does not meet the effluent limitations specified in Table 4-5 while treating wastewater for the existing population of 1,040 people, and the build-out population is significantly greater than 1,040 residents, the facility alternatives discussed in Section 5 must consider alternative disposal methods.

not true

Potential alternative disposal methods will have to meet the receiving water quality criteria of the respective receiving waters. Other than Plummer Creek, the only other feasible receiving waters are groundwater below a subsurface soil absorption system (SSAS), groundwater below surface

Service line I/I ?

vegetation in a continued land application system, and groundwater below a "leaky" artificial wetland or overland flow system. Groundwater quality criteria are found in the Idaho Administrative Rules (IDAPA) 58.01.11. IDAPA 58.01.17 defines the terms under which wastewater can be land applied. In addition, land application of wastewater is addressed as follows:

Land Application Facility Or Facility. Any structure or system designed or used to treat wastewater through application to the land surface.

Rapid Infiltration System. A wastewater treatment method by which wastewater is applied to land in an amount of twenty (20) to six hundred (600) feet per year for percolation through the soil. Vegetation is not generally utilized by this method.

Time Distribution of Flows. A measurement of the volume of wastewater distributed over a specified area during a specified time period. Typical unit of measure is inches per acre per week.

?

From a practical standpoint this document has been prepared with the principle that treatment systems evaluated for disposal, in whole or in part, to groundwater will meet or exceed groundwater quality standards at the end of the pipe from the treatment facility prior to the effluent entering the soil.

No

Specifically, the design criteria for ground water quality will be as defined in Table 4-4.

5.00 Collection System Evaluation

Indian Health Services (IHS) published the *Plummer Community Sewer System Condition Report* in February 2000, outlining a program to reduce the remaining inflow in the City of Plummer wasetwater collection system. The IHS report was prepared to enable the City to end a moratorium on new construction caused by the lack of capacity in the existing wastewater facilities.

Wyatt Engineering has contracted with Missoula Blue Print to prepare an aerial photogrammetric map of Plummer, with ground control provided by Wyatt Engineering's surveyors. Based on this mapping, an inventory of the City's manholes will be conducted to update the IHS' document, and provide the basis for collection system improvement design. The inventory in the IHS document will be used as a guide for the most critical areas, and provide the basis for assessing which pipes to replace or improve. The IHS report's inventory will also serve as a comparison for the conditions noted by Wyatt Engineering. Once the supplemental inventory is complete, Wyatt Engineering will prepare a Collection System Design Report, which will be submitted to the Idaho Department of Environmental Quality for review and acceptance. Design documents will be prepared based on the IDEQ- accepted Collection System Design Report. OK

Collection system improvement options will include conventional trenching and pipe placement, pipe bursting, pipe slip-lining, manhole lid replacement, manhole replacement, manhole repair with pressure grout, and manhole slip- lining. The most critical portions of the collection system will be marked for replacement based on the program budget of $1,264,000 that was defined in the IHS report. OK

Construction of collection system improvements will begin in spring, 2003, and be completed by November, 2003. Once the collection system improvements are complete, flow monitoring data collection will commence to determine the effectiveness of the I/I removal program. By November, 2004, after one year of collection system flow monitoring, the treatment system portion of this facilities plan will be re-evaluated. Should the collection system improvements cause significant reductions in inflow, the equalization requirements for the wastewater facility may be reduced in size accordingly. OK what are these limits?

6.00 Treatment Options Evaluation

Any of the treatment system improvement options described in this section would be constructed in one phase. As the current compliance order from EPA Region 10 requires achieving discharge limits to Plummer Creek by January 1, 2007, there is not sufficient time to accommodate any additional construction phases.

Based on the proposed schedule, it is anticipated that the construction project to improve the treatment facilities will begin in the spring or summer 2005, and will be completed by fall 2006.

Figures illustrating each treatment option can be found at the end of Section 6.00.

6.01 Option #1 - Modify Existing Lagoons to a Biological Treatment Plant Discharging to Plummer Creek and Land Application

As discussed, the existing treatment facility does not meet criteria established in the 1982 NPDES permit. It is therefore academic that the existing facility will not meet the more stringent water-quality requirements that are likely to be imposed on continued discharge to Plummer Creek. Therefore, an obvious option is to upgrade the existing facility to meet expected permit limits.

To achieve proposed water quality limits within the physical confines of the existing facility, several upgrades will be necessary. First, in the cover memo for the WLAP, Mr. Gary Gaffney wrote, "If and when the city undertakes upgrading of the wastewater treatment plant now being proposed and likely to occur within 5 to 10 years, DEQ will require that the project includes installation of a liner in each of the lagoons."

BNR

Prior to installing liners, the lagoons will need to be increased in size in order to provide sufficient volume for biological nutrient removal. The calculations for this increase are included on a spreadsheet printout labeled "PlummerProcTribe.xls", located in Appendix V. Since there is no more room on the existing site to expand horizontally, the lagoons must be made deeper. It is likely that there is a high water table in the vicinity of the lagoons, due to their proximity to Plummer Creek. Therefore, a hypothetical de-watering procedure was developed. This procedure would include excavation of gravel-filled de-watering trenches drained by tile piping connected to a series of de-watering sumps. The de-watering system would be abandoned or partially converted into the routing for the sludge removal system, which is outlined below.

$1.6M

Other necessary upgrades to the facility for this alternative include **additional storage** for wastewater received between the middle of October, when land application ends, and the middle of November, when discharge to Plummer Creek is again allowed. Based on a water balance simulation using a spreadsheet model, Wyatt Engineering determined that the minimum basin size is **eight acres in area, approximately** 10.5 **million gallons at four feet deep,** enough to store **45 days of flow.** A basin of this size will prevent discharge over a stochastically-simulated 20 year period of rainfall and average evaporation. A copy of the model print-out is in Option 1, Tribe, in Appendix V.

Another adaptation for this option is construction of a **sludge removal system.** To prevent damage to the lagoon liner and maintain the hydraulic capacity of the lagoon system, it will be necessary to construct a sludge pumping system. Sludge will be pumped to drying beds next to the site of the equalization lagoons, tentatively located at the site of the old state gravel pit across the road from the treatment plant.

To convert the lagoons into a **dual-train system** as required in the ten-state standards, and to provide flexible partitions for anoxic, aerobic, and anaerobic zones, a baffle system will be constructed to supplement the berm between the current first and second lagoon cells.

To achieve the proposed phosphorus discharge limits shown in Table 4-5, the plant will need to employ biological nutrient removal, chemical addition prior to wastewater entering the anaerobic cells, disinfection, and filtration. With this combination of treatments, it is probable that the strict limits proposed can be met. Probable phosphorus removal was calculated using standard removal efficiencies for the listed processes, and an estimated phosphorus loading of 10 mg/L, with about 70% soluble (Clark et al, 1979). By using what has become known as a "Bardenpho" process, alternating anoxic, aerobic, and anaerobic treatments, bacteria specializing in those environments successively oxidize phosphorus and complex the resulting phosphates to achieve removal rates double or triple the 20 to 30 percent removal achieved with conventional activated sludge alone.

Chemical addition of alum achieves an additional 90 percent reduction in phosphorus by causing dissolved phosphate to sorb onto alum floc, which then settles to the bottom of the cell. Filtration following alum addition and settling will result in a further 50 percent reduction in phosphorus.

Prior to discharge, effluent will pass through ultraviolet radiation **(UV) disinfection** channels. UV disinfection is recommended because of the ease and safety to the operator and the lack of a residual chemical, such as cholorine, to either remove or poison the receiving water.

The existing aerators will be replaced with a fine-bubble diffusion aeration system that allows the operator to adjust where aeration takes place in the baffled system, and enables easy maintenance and replacement of diffusion heads.

The **existing sand filters** will be lined and retrofitted with a finer sand, and have an enhanced surface distribution system that evenly distributes wastewater from the anaerobic cell or equalization cell (the existing third cell) over the surface of the sand filter.

Discharge to Plummer Creek during the **November 15 through May 15** period will be controlled by an in-stream flow meter that will throttle the effluent flow rate to no more than ten percent of the stream flow.

Additional land will be necessary for Plummer to continue to land apply during the growing season. Along with the additional land it will eventually be necessary to **upgrade the** existing 530 to 660 gpm capacity **irrigation pumps**. The existing pumps will function as both return-flow pumps and irrigation pumps. During discharge to Plummer Creek, they will circulate a side-stream of anaerobically-treated wastewater from the down-stream end of what is now the second cell, back to the upstream end of what is now the first cell for anoxic treatment.

Other necessary enhancements include a computer system, a pump station located near the existing influent manhole, and additional piping. The computer system will assist the operator in selecting the correct valving and pumping options given current process parameters. It will also help the operator calculate those process parameters. The influent manhole pump station will be necessary to provide pump-back to the storage lagoon. Additional process piping will be necessary to provide the operator with the flexibility necessary to meet permit limits under changing flow, temperature and influent wastewater characteristics.

The estimated cost for this option for engineering, construction, and a 20 percent contingency is **$7.55 million**. Cost estimate data was collected from suppliers, Means Construction Cost Index, and previous projects completed by Wyatt Engineering. Using an annual inflation rate of 4%, the present value of 20 years of operation of this option at $125,000 per year is $1.7 million.

6.02 Option #2 - Mechanical Biological Treatment Plant Discharging to Plummer Creek and Land Application

The second option is very similar to the first option in terms of the degree of treatment received and the discharge selection. The primary difference is that this option includes purchase of a package mechanical activated sludge plant capable of biological nutrient removal. As a result of this difference, the City of Plummer would no longer have its plant on leased ground, but instead it would be on land purchased from either the state or a private land owner near the existing plant site.

An equalization basin and pumping from the existing influent manhole would still be necessary for this option. The second cell of the existing facility would be converted into a lined cell to provide storage, or a new basin could be constructed on the state land to provide the required 45 days of storage outlined in the text describing Option #1. Also as with the first option, additional land will be necessary for land application to crops.

B.S.

In addition to the base package plant, sludge dewatering equipment and drying beds will be required, as will alum addition, UV disinfection, and polishing filtration, if necessary. The package mechanical plant will have an integrated, computerized operating system utilizing pneumatic valve actuation. The aeration will be provided by a fine-bubble diffusion aeration system that allows the operator to adjust where aeration takes place in the baffled system, and enables easy maintenance and replacement of diffusion heads.

No

Discharge to Plummer Creek during the November 15 through May 15 period will be controlled by an in-stream flow meter that will throttle the effluent flow rate to no more than ten percent of the stream flow. During periods near the beginning and end of each creek discharge season, plant operation may utilize the storage lagoon to prevent excess discharge to Plummer Creek.

This treatment alternative is capable of meeting or exceeding all of the discharge parameters listed in Table 4-5.

The estimate for this alternative is based on information supplied by Aero-Mod, who design, manufacture and support custom package wastewater treatment plants The estimated cost for this option for engineering, construction, and a 20 percent contingency is $5.13 million. Using an annual inflation rate of 4%, the present ~~value~~ of 20 years of operation of this option at $101,000 per year is $1.4 million.

1065

6.03 Option #3 - Total Containment

This alternative ~~consists~~ of retrofitting the existing lagoons with impermeable membrane liners, and providing an additional 478 acres of membrane-lined evaporative lagoon(s). This much capacity would preclude the need for discharge, and provide sufficient capacity for the design flow rate discussed in Sections 3 and 4.

The required size of the additional evaporative lagoon was determined using a stochastic rainfall as a component of a water balance model. The stochastic rainfall approach utilizes historic average monthly precipitation data and both five-year high and five year low precipitation data to develop a random rainfall distribution for Plummer. By simulating 20 years of such precipitation, the result is a conservative estimate of the lagoon sizing necessary to prevent overflow for the statistically-likely high 20-year rainfall set within statistically-likely precipitation patterns. This simulation methodology is superior to using actual rainfall records, because it is at least as likely to predict future events as actual past rainfall, and it enables many different 20-year scenarios; each recalculation changes the random number generator, and thus instantly develops an additional 20-year scenario.

Evaporation rates for the lagoon model were determined using an average of the historic monthly pan evaporation data from Sandpoint and Moscow, Idaho. Pan evaporation was corrected to water body evaporation using the approach of Linsley et al (Linsley, Kohler, Paulhus, *Hydrology for Engineers*, 1986).

Since there would be no discharge to surface water, this alternative would eliminate the need for an NPDES discharge permit and discharge monitoring.

However, the estimated construction, engineering and contingency cost for this alternative is $92.49 million. This figure is based on prevailing geomembrane installation costs, a 20% contingency, and engineering costs totaling 20% of construction costs. This option would include essentially zero operating cost.

What lease about ownership issue

6.04 Option #4 - Modify Existing Lagoons to a Biological Treatment Plant Discharging to Cascading Overland Flow/Wetland

This alternative would retrofit the existing lagoons with impermeable membrane liners. This alternative would preclude the need for discharge to Plummer Creek, and it would provide sufficient capacity for the design flow rate discuss~~ed in~~ Sections 3 and 4.

won't work can't be approved.

The sizing analysis conducted for this alternative utilized the same approach as that for Alternative #3, with stochastic rainfall simulation and evaporative rates derived from historic Spokane Airport and Lind, Washington data. In addition, a very conservative estimate of infiltration equivalent to 1 x 10^{-5} cm/sec. was used to simulate the infiltration rate into the soil of the existing land application area. Even under constantly saturated conditions, it is very unlikely that the soils at this location have that low of a permeability. Converting Soil Conservation Service permeability from the Benewah County Soil Survey for the subject soils yields a worst-case permeability of 5 x 10^{-5} cm/sec.

Since there would be no discharge to surface water, this alternative would also eliminate the need for an NPDES discharge permit and discharge monitoring, though a state waste discharge permit is still required.

The existing lagoon system would need to be lined, as discussed under the first option. In addition, for this alternative, biological treatment and UV disinfection would be necessary to assure that the surface-applied wastewater met WLAP application standards. Nutrient removal would not be necessary, nor would there be a need to change the existing lagoon depth or area, as the current configuration is adequate to achieve the level of treatment required. The existing sand filters would be abandoned.

Process design calculations for this alternative are included in Appendix V under the spreadsheet "PlummerProcOverFlowTribe.xls". These calculations show that the treatment plant will provide flow to the cascading overland flow system with a chemical oxygen demand of 60 mg/L or less, a nitrogen level of 10 mg/L or less, and a phosphorus level of 5 mg/L or less.

The estimated construction, engineering and contingency cost for this alternative is $3,508,000. Cost estimate data was collected from suppliers, Means Construction Cost Index, and previous projects completed by Wyatt Engineering. Using an annual inflation rate of 4%, the present value of 20 years of operation of this option at $120,000 per year is $1.6 million.

6.05 Option #5 - Modify Existing Lagoons to a Biological Treatment Plant Discharging to Dripline Subsurface Disposal

The objective of this alternative is to meet land application water quality requirements in the current WLAP permit while utilizing the existing lagoon system. Several subsurface disposal options were investigated for feasibility and cost. Subsurface dripline wastewater disposal systems have recently been approved for use in Washington. These systems utilize shallow, small diameter perforated tubing laid out roughly along contours through existing native vegetation, without destroying that vegetation in the process. The tubes are installed by punching through the surface with a specially-designed installation machine. Other subsurface disposal systems that were investigated include conventional gravity systems and pressure mound systems. Due to terrain constraints, a conventional gravity system is not feasible. Subsurface drip systems were found to be less expensive than a mound system for the equivalent loading rate.

PHD permit

Pilot year round use

The existing lagoon system would need to be lined, as discussed under the first option. In addition, for this alternative, a modest degree of biological treatment would be necessary to assure that the subsurface-applied wastewater met WLAP application standards, with the exception of disinfection. Nutrient levels will need to be somewhat less than those allowed under normal land application, due to the year-round application schedule and somewhat less uptake by vegetation. There would be no need to change the existing lagoon dimensions, as the current configuration is adequate to achieve the level of treatment required. The existing sand filters would be abandoned.

Two expensive components of this option include replacing the land application pumps with an alternating dosing pump system, and the addition of additional lined storage to absorb high inflow loads beyond the design capacity of the drip line system. The alternating dosing system would use a timed dose to provide a measured amount of wastewater to each section of drip line, thus avoiding overloading of any of the drip line beds.

1.6m

The new lined storage lagoon would be located on the state gravel pit site across the road from the existing WWTDF. The lagoon would cover about 7.5 acres, and hold 10 million gallons, about 40 days of storage at average daily flow rates.

The timed dose system will be provided by the drip-line manufacturer to insure that the system works together. It will be set up to dose at a rate of 0.2 gallons per square foot per day, with each drip line receiving two eleven-minute doses per day. Drip lines will be one-inch diameter polyethylene tubing, with pre-manufactured orifices placed every 12-inches along the length of the drip tubes. The drip lines will be clustered 4 drip lines per bed, with 21 or 22 beds per dosing zone. There will be 56 dosing zones, covering a total of 30 acres.

Process calculations are provided in Appendix V, in a memorandum from Tracy Johnson to Alan Gay.

This treatment alternative is capable of meeting or exceeding all of the discharge parameters listed in Table 4-4.

The estimated construction, engineering and contingency cost for this alternative is $4,732,000. Cost estimate data was collected from suppliers, Means Construction Cost Index, and previous projects completed by Wyatt Engineering. Using an annual inflation rate of 4%, the present value of 20 years of operation of this option at $120,000 per year is $1.6 million.

6.06 Option #6 - Mechanical Biological Treatment Plant Discharging to Dripline Subsurface Disposal

The objective of this alternative is to meet groundwater quality requirements in the current and future WLAP permits without as much installation of expensive impermeable membrane liners required for retrofitting the existing facility. This alternative would utilize the same processes as those discussed for Option #2 for treatment, except no alum addition would be required, nor would there be any need for disinfection.

The equalization storage, no disinfection, and discharge set-up requirements would be identical to those required for Option #5.

This treatment alternative is capable of meeting or exceeding all of the discharge parameters listed in Table 4-4.

The estimated construction, engineering and contingency cost for this alternative is $6,467,000. Cost estimate data was collected from suppliers, Means Construction Cost Index, and previous projects completed by Wyatt Engineering. Using an annual inflation rate of 4%, the present value of 20 years of operation of this option at $80,500 per year is $1.1 million.

6.07 Option # 7 - Mechanical Biological Treatment Plant Discharging to Cascading Overland Flow/Wetland

This system combines the advantages of operating a package mechanical wastewater treatment facility on ground to be owned by the City with the high loading, low maintenance and year-round discharge advantages of discharging to a cascading overland flow wetland area. This is the preferred option for treating and disposing of the City's wastewater in the future.

The subject overland flow site, now used for land application, meets the criteria for a cascading overland flow system set forth in *Natural Systems for Wastewater Treatment, 2nd Edition* (Water Environment Federation, 2001). The site soil profile shown in the *Soil Survey of Benewah County, Idaho* (USDA SCS, 1980) indicates that soils on the north side of State Route 28 are shallow silt loam, and cobbly or gravelly silt loam over bedrock. In addition, the hydrogeologic assessment conducted by Teresa Kristof of Wyatt Engineering indicates that the soils in the vicinity of the proposed overland flow system are moderate to deep clayey loess (wind-deposited volcanic ash/silt) overlying basalt.

We will employ a flow of 250,000 gallons per day for our design criteria, with peak flows of 527,000 gpd. With those influent flows, a conceptual geohydrologic model of the land application area indicates that using 20 acres of the available 27 acres now used for land application as a cascading overland flow wetland could hydraulically

2

Where

accommodate a peak flow rate of 250,000 gallons per day year-round, with an annual peak month flow of as much as 1.1 mgd without a breakthrough.

The cascading overland flow system will be constructed with gravel underdrains for each soil berm defining a terrace of the cascading system. A header pipe will be installed in a french drain at the top of the overland flow system, running parallel to Toetly Road on the north end of the site. At the south, bottom end of the system will be a sump with a pump-back lift station that will work with a check valve to pump return flow, if any, back up to the header pipe along Toetly Road, preventing discharge to surface water.

As stated under Option #4, the nutrient and chemical oxygen demand loads will be quite small compared to the land application capacity of the site. Along with soil absorption, there will be uptake by the wetland plants that has not been calculated into the nutrient balance allowance.

The estimated present value cost for this alternative of $4,239,000 is based on construction of a cascading overland flow system and a package mechanical treatment plant. The cost estimate for the cascading overland flow system assumes that wetland plants will be seeded as well as naturally re-establish over time to provide soil stabilization and nutrient uptake. Other estimate information for the system was obtained from, Means Construction Cost Data, an inflation rate of 4%, a 20% contingency, and engineering costs totaling 20% of construction costs. The annual operations and maintenance expenses for the total wastewater facilities are estimated to be $120,427, including $74,000 to operate and maintain the new treatment facility. The present value cost for 20 years of operation assuming a 4 percent annual inflation rate is $1.6 million. The operations and maintenance estimate includes the cost of anticipated tests, routine maintenance, and permit renewal costs every five years for land application permitting.

6.08 Cost Comparison of Seven Wastewater Treatment Options

The seven alternative treatment technologies are compared in Table 6-1.

Table 6-1 Opinion of Probable Cost Tabulation, Treatment Facilities Only

Rank	Option	Capital	Capita less Engineering	Engineering	20 Yrs Operations
6	#1	$7,552,000	$6,341,000	$1,211,000	$1,698,000
4	#2	$5,131,000	$4,310,000	$822,000	$1,378,000
7	#3	$92,485,000	$77,681,000	$14,803,000	$0
2 X	#4	$3,508,000	$2,946,000	$562,000	$1,635,000
3	#5	$4,732,000	$3,973,000	$759,000	$1,636,000
5	#6	$6,467,000	$5,432,000	$1,035,000	$1,094,000
1 *	#7	$4,239,000	$3,560,000	$679,000	$1,003,000

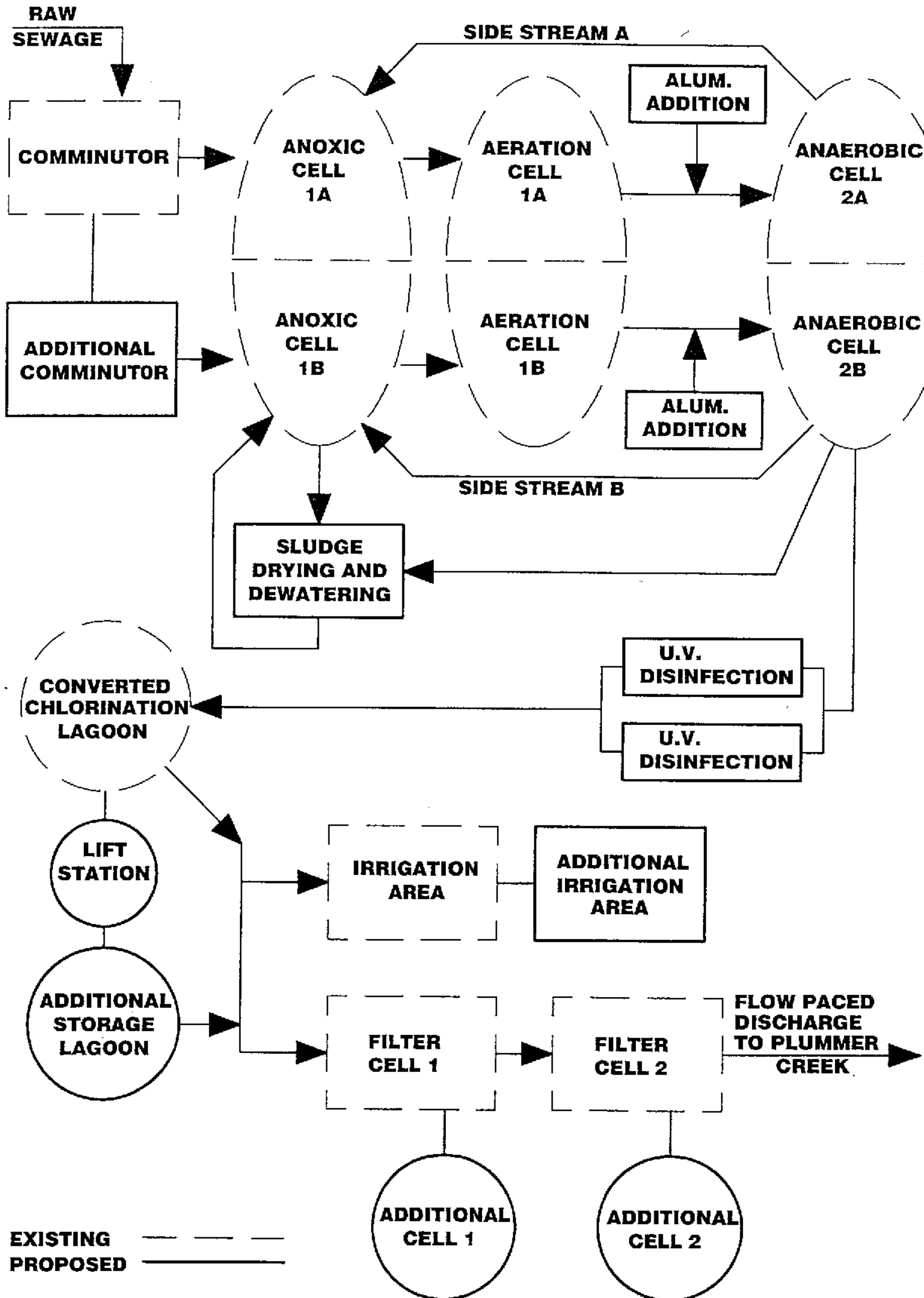


FIGURE 6-1
OPTION 1 SCHEMATIC - MODIFY EXISTING LAGOONS

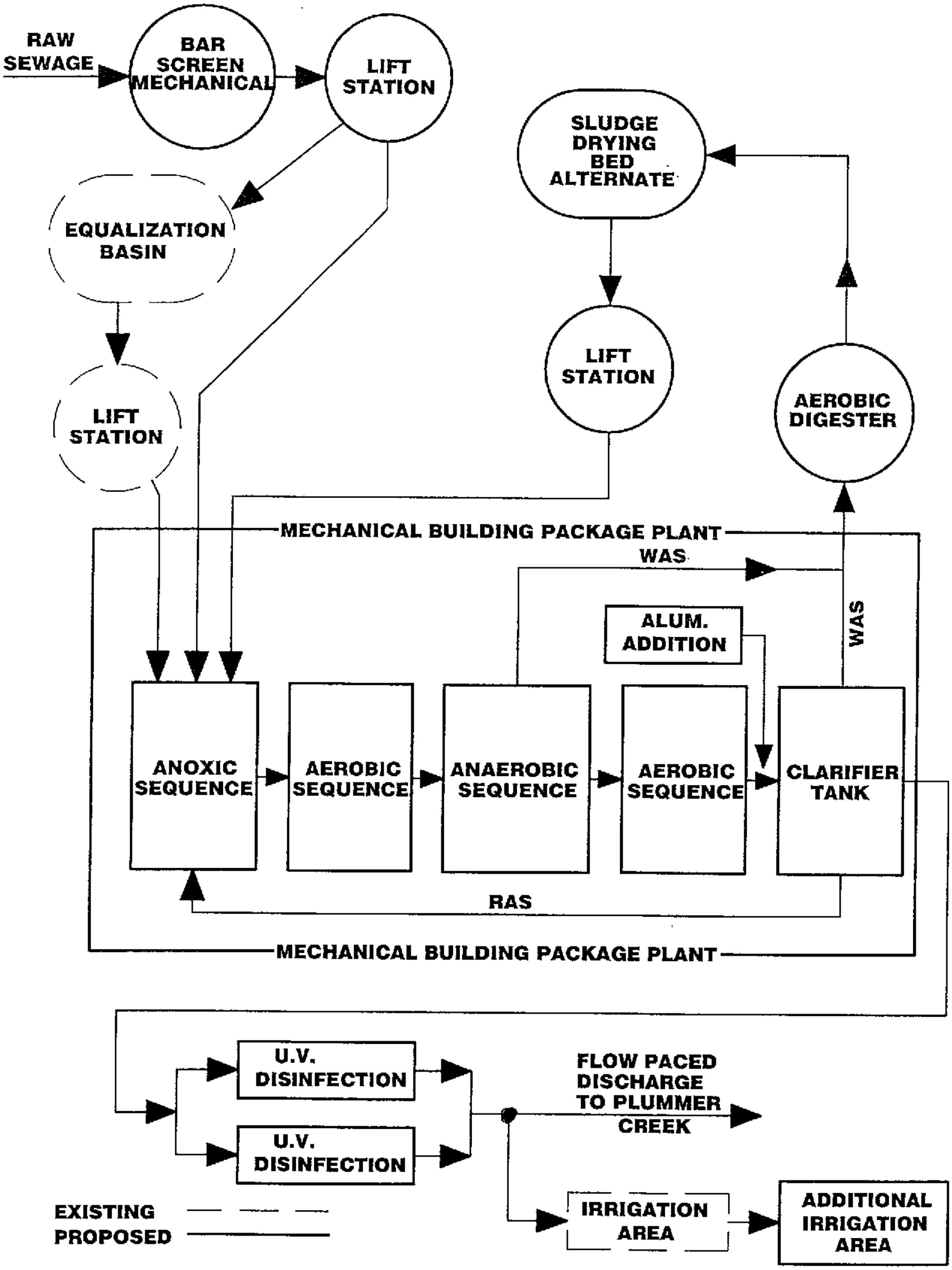
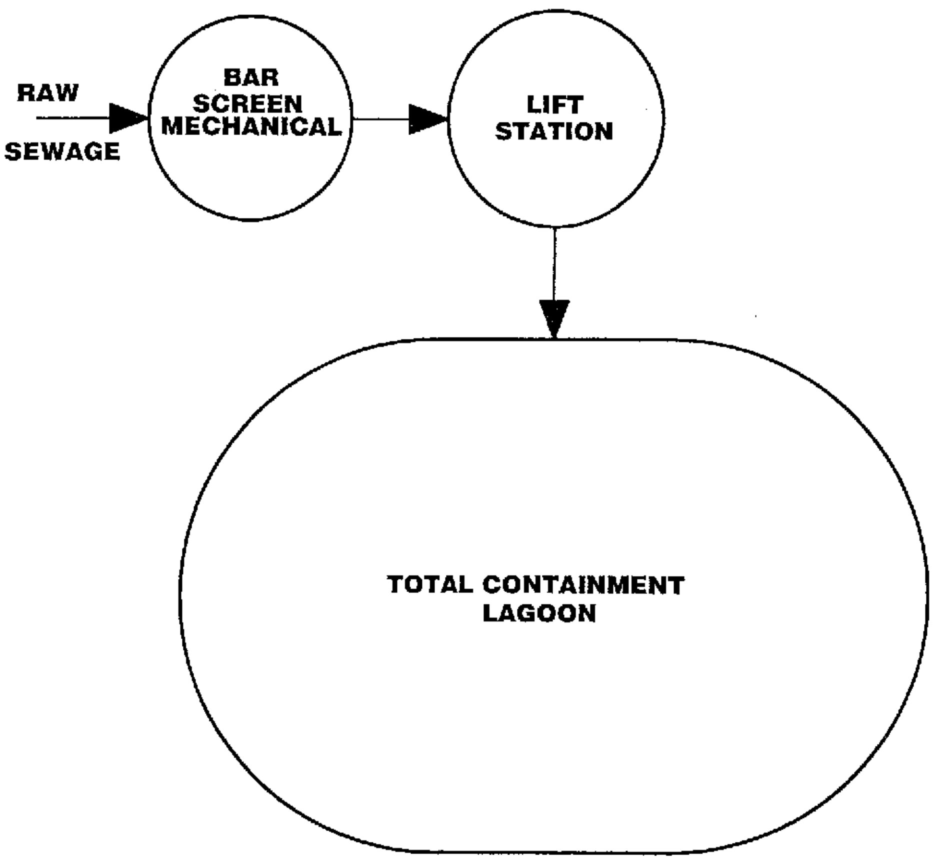


FIGURE 6-2
OPTION 2 SCHEMATIC - MECHANICAL PACKAGE PLANT



Won't work

EXISTING — — —
PROPOSED ———

FIGURE 6-3
OPTION 3 SCHEMATIC - TOTAL CONTAINMENT

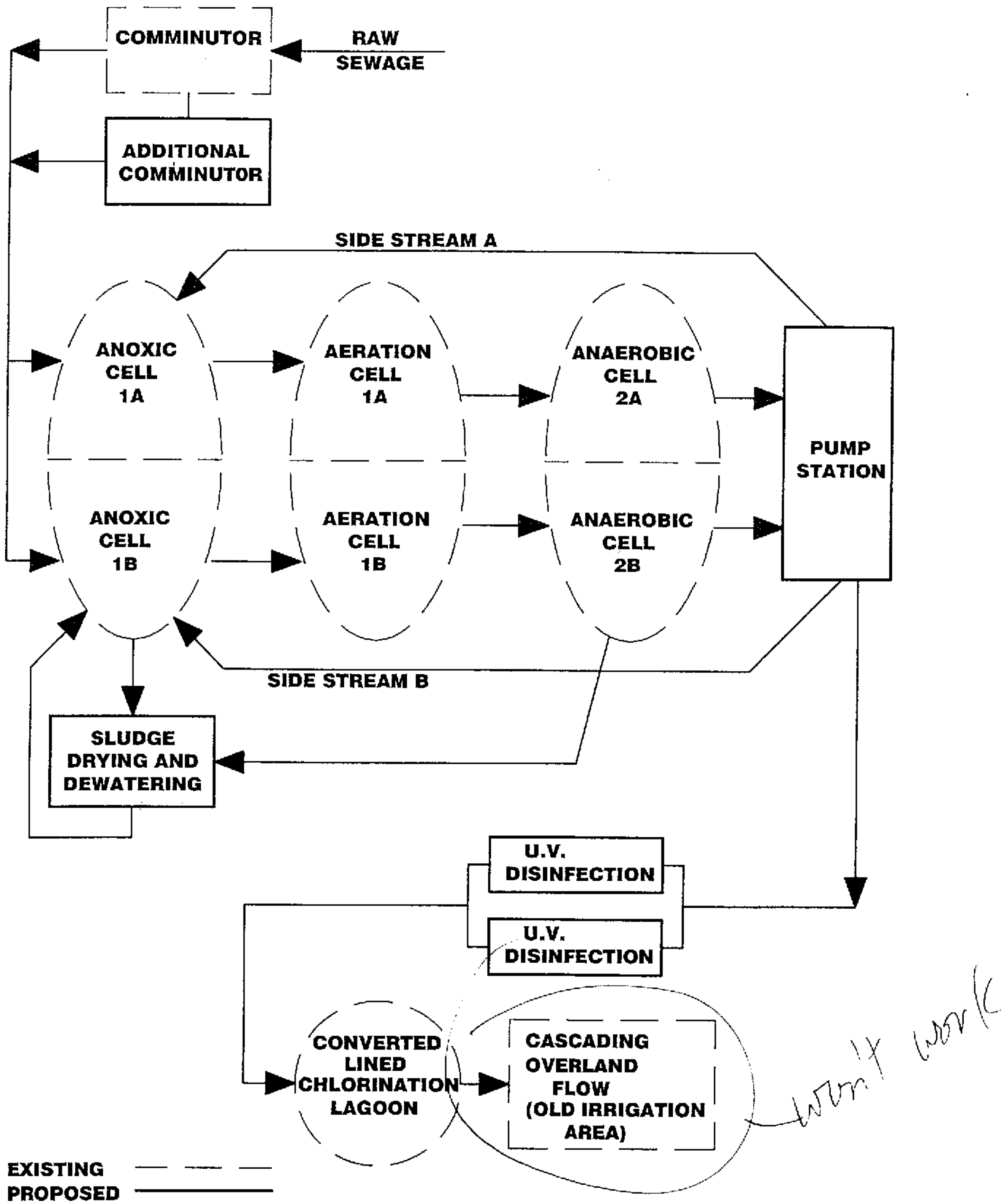


FIGURE 6-4
OPTION 4 SCHEMATIC - MODIFIED LAGOONS DISCHARGE TO CASCADING OVERLAND FLOW

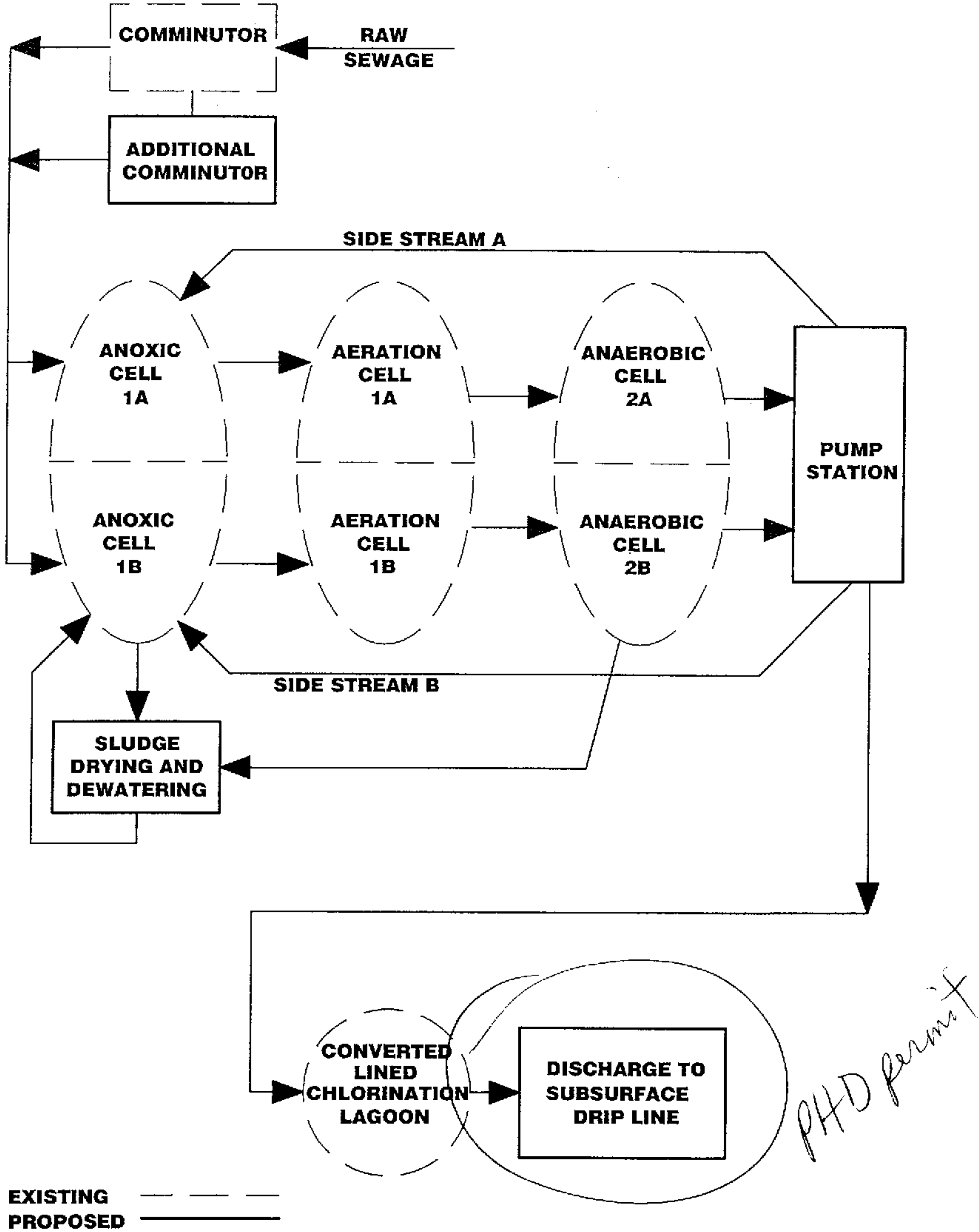


FIGURE 6-5
OPTION 5 SCHEMATIC - MODIFIED LAGOONS DISCHARGE TO SUBSURFACE DRIPLINE

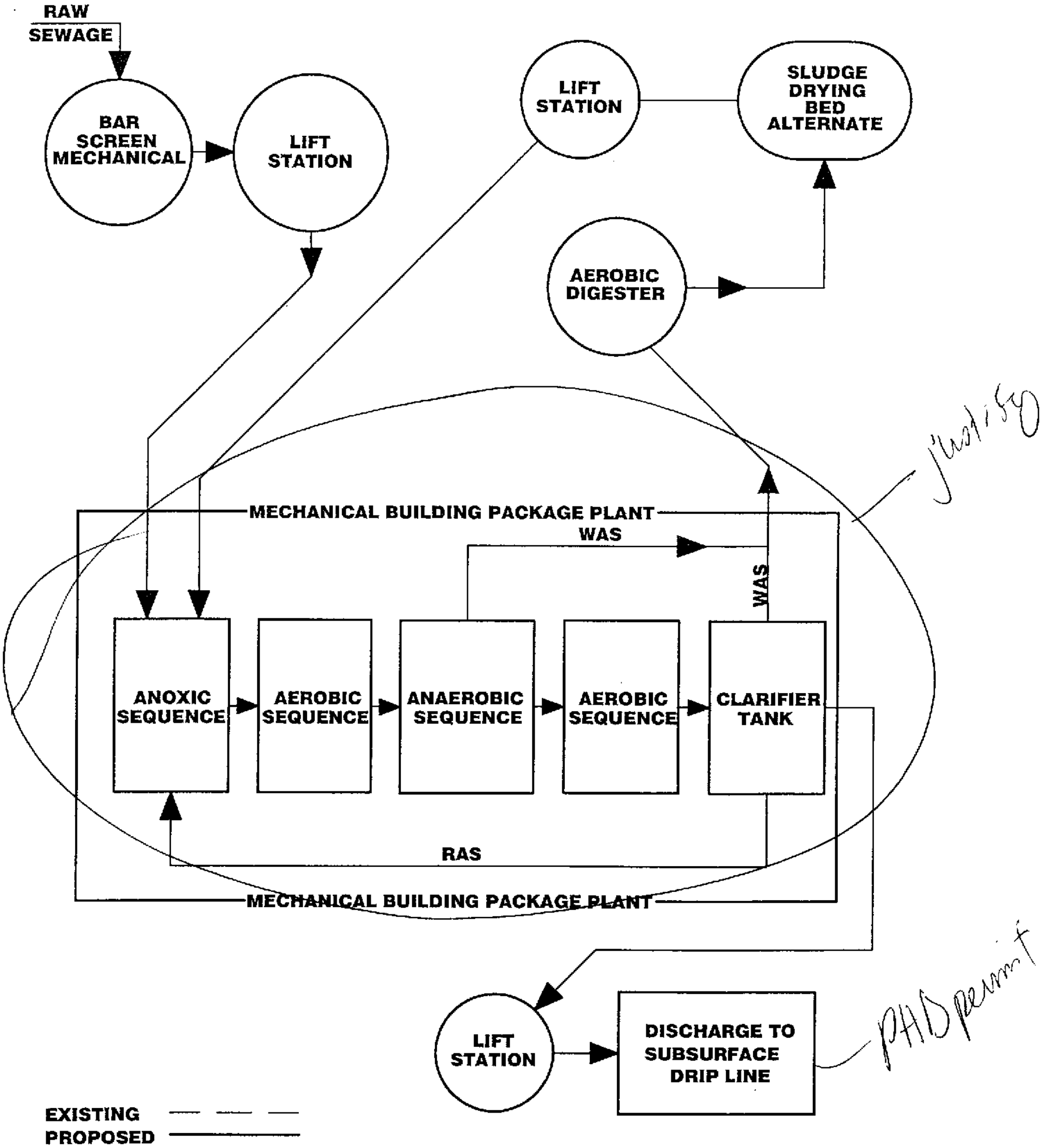


FIGURE 6-6
OPTION 6 SCHEMATIC - MECHANICAL PACKAGE PLANT DISCHARGE TO SUBSURFACE DRIP LINE

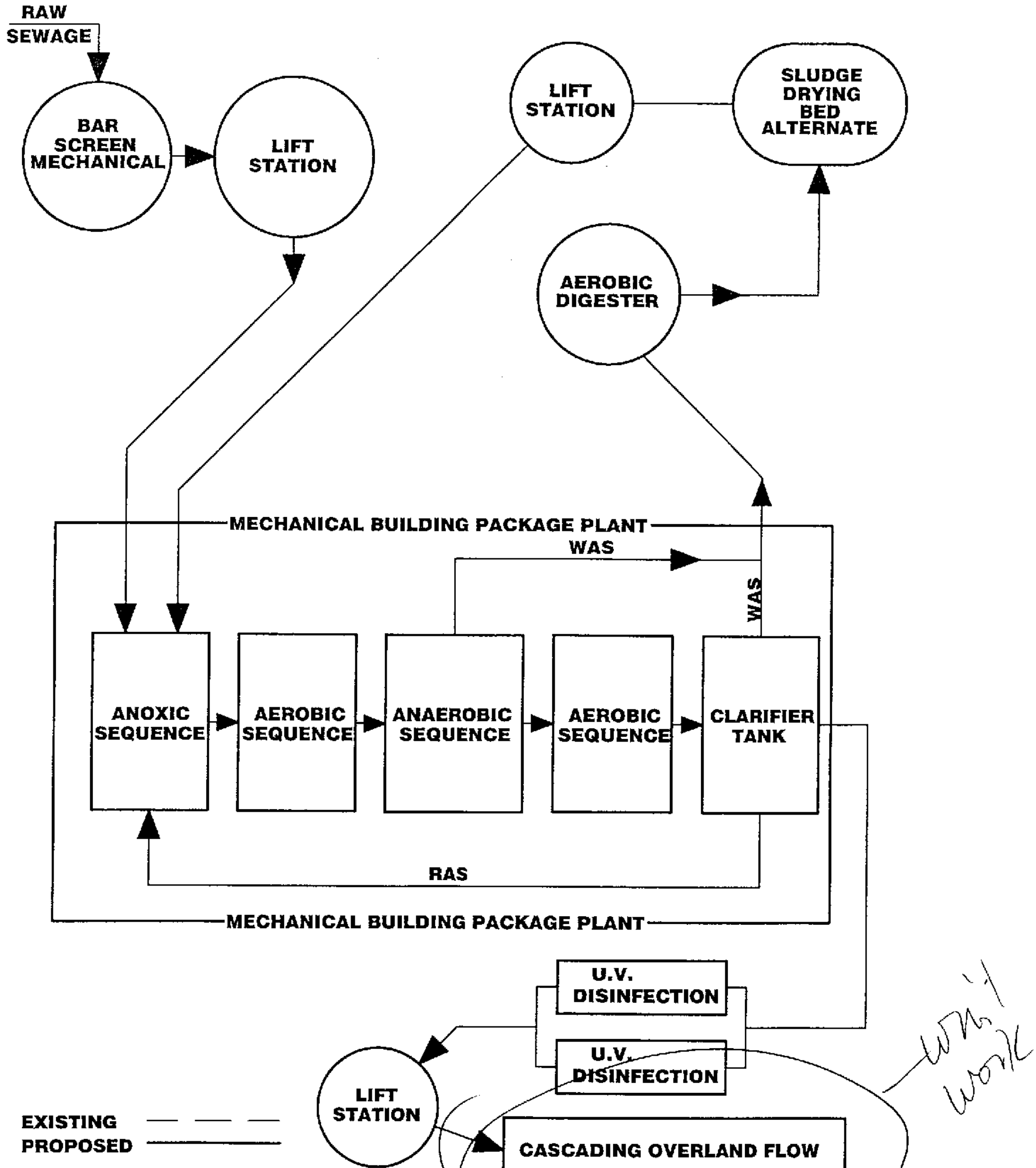


FIGURE 6-7
OPTION 7 SCHEMATIC - MECHANICAL PACKAGE PLANT DISCHARGE TO CASCADING OVERLAND FLOW

7.00 Selected Options

Option #7 has been selected as the most feasible cost-effective approach to treating Plummer's wastewater in the coming years. This alternative was evaluated using the criteria established in Sections 3 and 4. In addition to the treatment facility, the inflow and infiltration reduction project outlined in Section 5 of this Report will begin immediately upon adoption of this report by IDEQ and the City Council of the City of Plummer. The projected total capital cost for the combined project is $5,503,000.

Influent and effluent testing will address the concerns of the Department of Environmental Quality regarding effluent quality. Effluent must also meet quality standards to maximize the life of the cascading overland flow wetland. This will be accomplished by optimizing the operation of the treatment plant.

The ultimate configuration selected for the wastewater treatment facility will be decided in the design phase of the project. It may be decided that the final design will be most cost effective and provide the most operational flexibility if a combination of discharge alternatives with the selected overland flow discharge is used. In addition, property ownership remains problematic. It may be advantageous to site the new treatment facility uphill from the cascading overland flow wetland area, thus changing the property ownership scenario and reducing required pumping to one major lift station up to the treatment facility. The major disadvantages to this scenario are unknowns about soil stability, property ownership, and power availability north of the land application area.

Figures 7-1 through 7-3 illustrate the preliminary site plan and hydraulic profile for the selected alternative. Figure 7-4 shows the proposed project schedule.

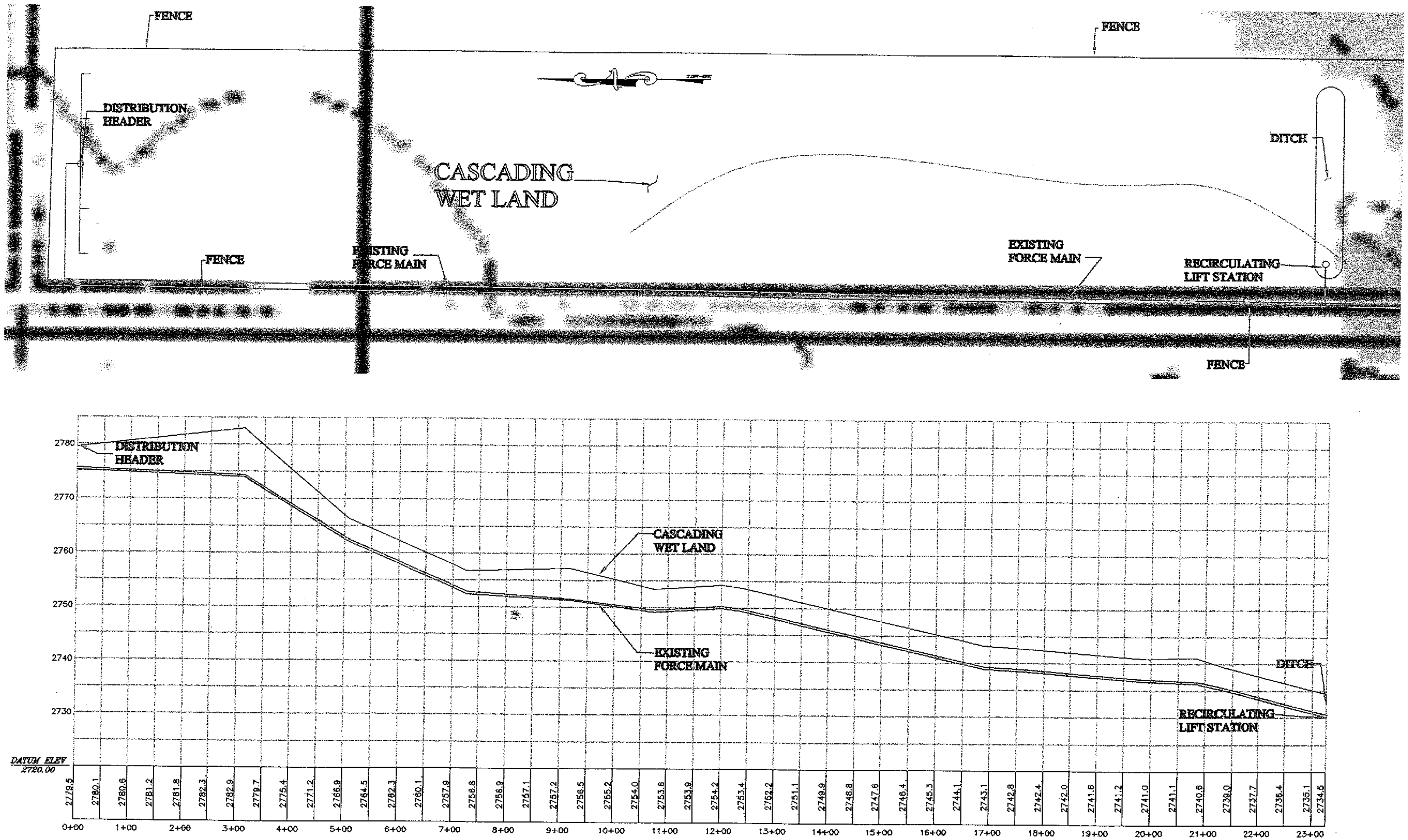
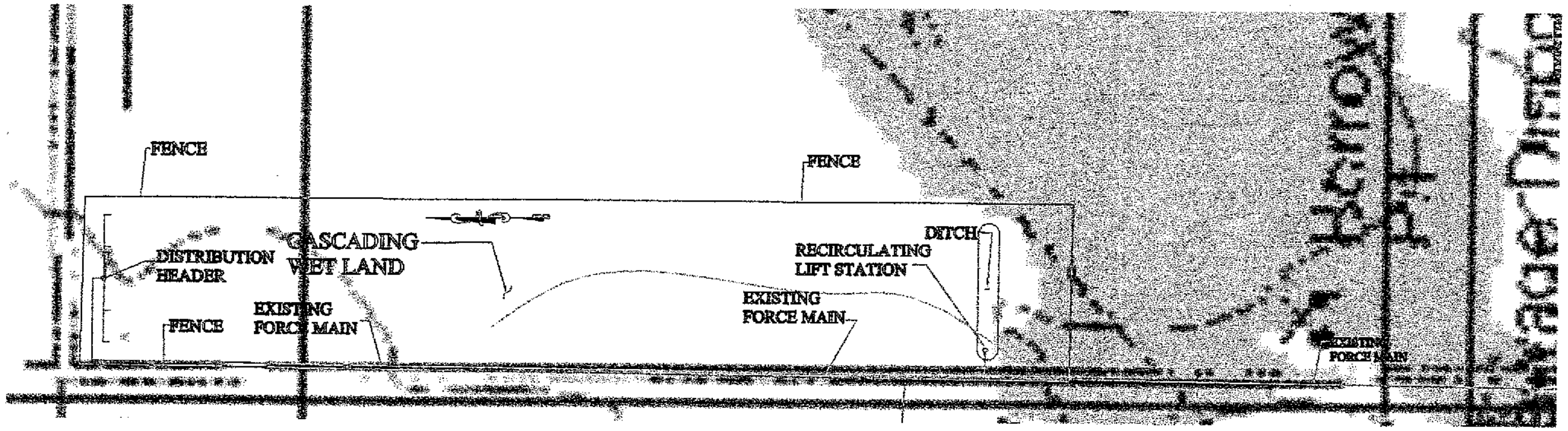
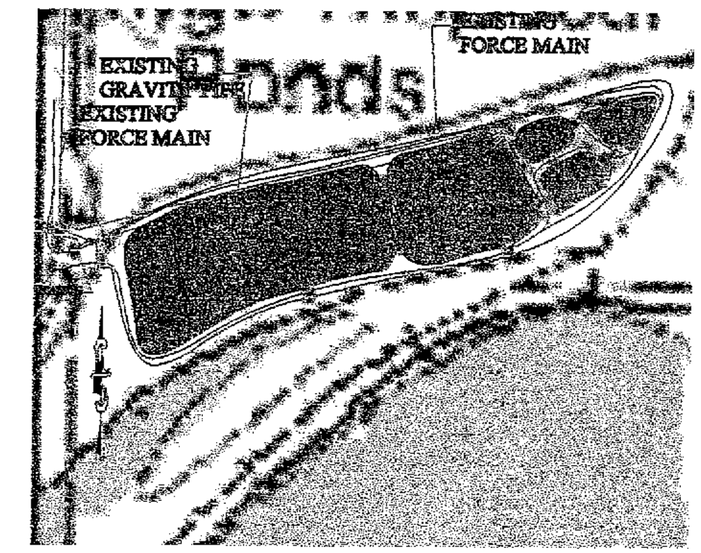


FIGURE 7.3
CITY OF PLUMMER HYDRAULIC PROFILE (CASCADING WETLAND)

SCALE: 1"=200'





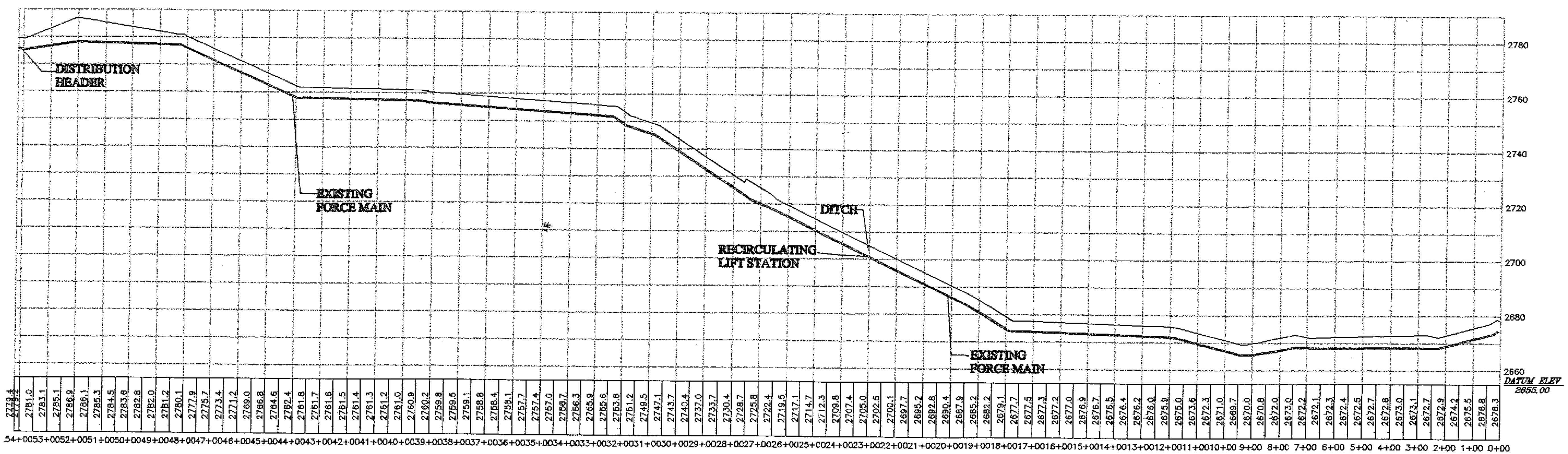


FIGURE 7.2
CITY OF PLUMMER HYDRAULIC PROFILE (EXISTING PIPING)

SCALE: 1"=400'

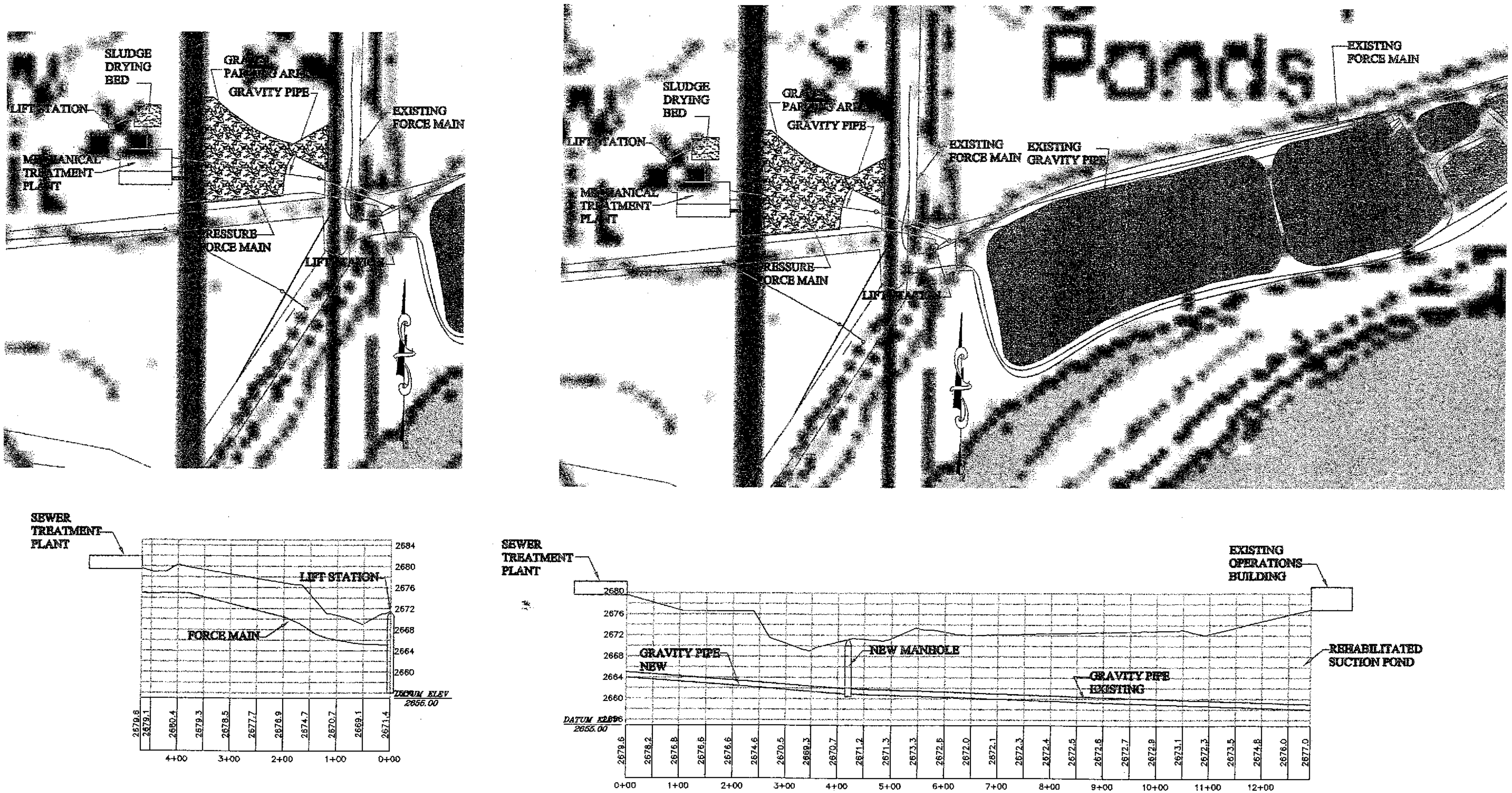


FIGURE 7.1
CITY OF PLUMMER HYDRAULIC PROFILE (PIPING TO & FROM NEW STP)

SCALE: 1"=200'

Plummer WWTP
07/31/02

Start: 08/01/02
Finish: 01/02/07

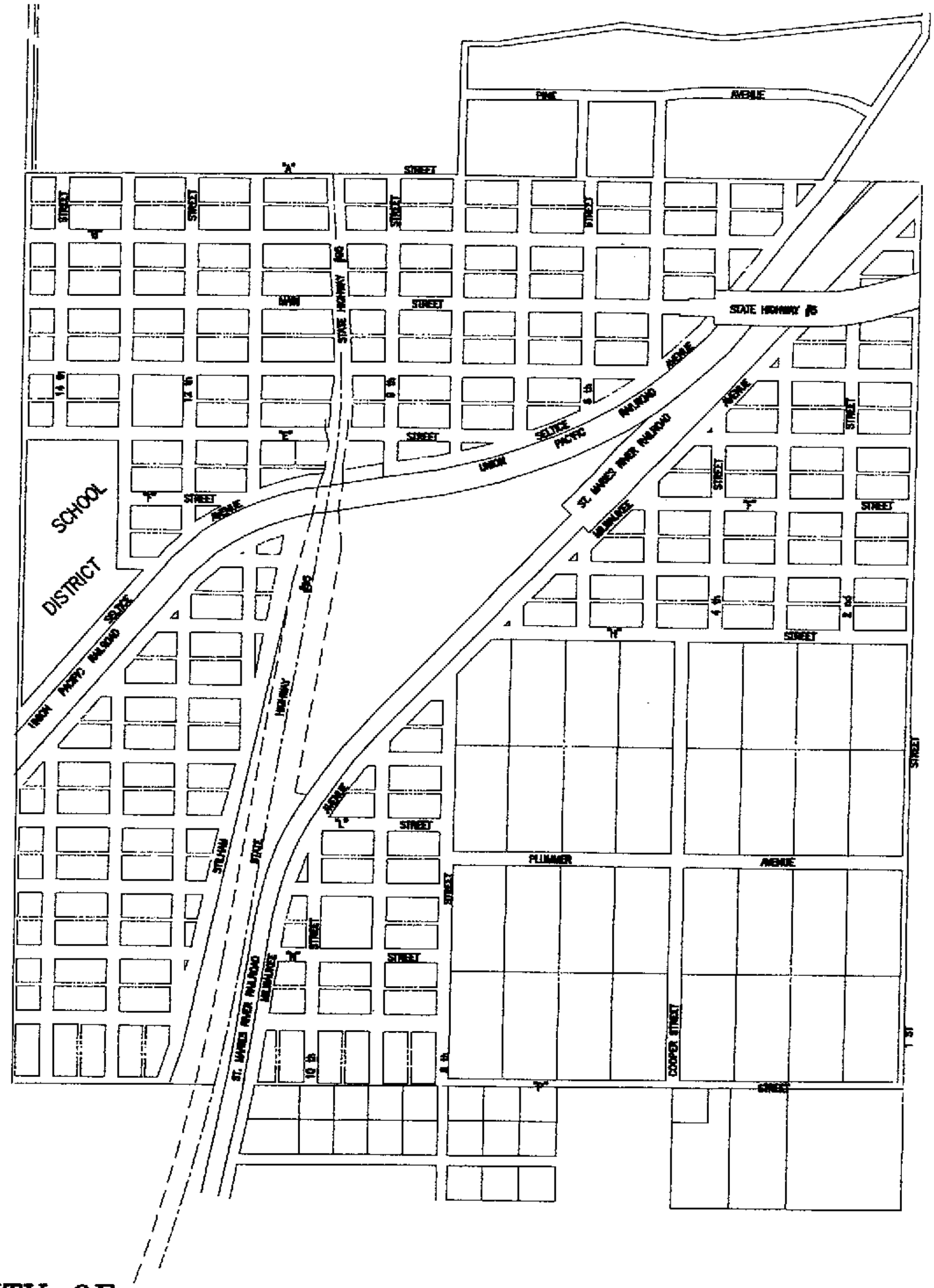
ID	Activity Name	Duration	Date
1	Plummer WWTP	1153	08/01/02 – 01/01/07
2	Piezometer Install	15	08/01/02
3	Aerial Mapping	26	10/01/02
4	FacilityPlanning	44	08/01/02
5	**Facility Plan Review**	20	10/02/02
6	**ICDBG Application**	68	08/01/03
7	Water Quality Monitoring	262	08/01/02
8	Water Quality Limits Set	24	08/15/02
9	Engineering Est to City	1	09/12/02
10	Ordinance Calling For Bond Election	1	09/13/02
11	Bond Election	1	11/[illegible]/02
12	**I/I Reduction Design**	100	11/06/02
13	**IDEQ I/I Review**	20	03/26/03
14	**I/I Bidding & Award**	20	04/23/03
15	USDA I/I Funding Available	1	05/21/03
16	ICDBG Short List	1	12/17/03
17	ICDBG Interviews	1	04/22/04
18	**Collection System Construction**	138	05/21/03
19	**I/I Monitoring**	261	11/03/03
20	Confirmation of Flows	15	06/29/04
21	**Amend Facility Plan**	75	07/20/04
22	Land Purchase	15	11/02/04
23	**WWTP Design**	108	11/02/04
24	IDEQ WWTP Review	23	04/01/05
25	WWTP Bidding & Award	20	05/04/05
26	ICDBG Funding Available	1	06/25/04
27	USDA WWTP Funding Available	1	06/01/05
28	WWTP Construction	392	06/01/05
29	WWTP Start Up	86	09/01/06
30	WQ Compliance Data	1	01/01/07

Timeline: 2002, 2003, 2004, 2005, 2006, 2007, 2008 (J A J O quarters)

Legend: Project — Start (Early), Finish (Early); Subproject — Start (Early), Finish (Early); Critical Activity — Start (Early), Resource Names; Non Crit. Activity — Start (Early), Resource Names; Event — Start (Early), Name; Interface Event — Start (Early), Name; Non-Cum. Actual Profile; Non-Cum. Remaining Profile; Non-Cum. Baseline Profile; Cum. Act.+Rem. Profile; Cum. Baseline Profile

8.00 Financing

Financing is being arranged through the United States Department of Agriculture, Rural Development (RD). At this time, negotiations with RD have as a goal the commitment to fund all of the projected $5.503 million of program capital costs. Of this, $2,000,000 is being placed before the voters of Plummer in a bond election to take place in November, 2002. Grant money will make up the remaining RD funding that will be provided. The City of Plummer will adopt an ordinance increasing sewer utility fees from $17 per month to $43 per month to retire the $2,000,000 loan and pay for increased operations and maintenance costs. Loan fees and interest over the 30 year period will cost an additional $1,260,000 over the life of the loan.



CITY OF PLUMMER, IDAHO

NO CURRENT FLOOD ZONE INFORMATION AVAILABLE

FIGURE 8-1
CITY OF PLUMMER FLOOD ZONE MAP

SCALE: 1"=1000'

APPENDIX I

2000 CDBG Application
(Wyatt Engineering)

City of Plummer

P.O. BOX B
PLUMMER, ID 83851
PH. 208-686-1641

November 17, 2000

Mr. Gary Mahn, Director
Idaho Department of Commerce
700 W. State Street
P.O. Box 83720
Boise, Idaho 83720-0093

Dear Mr. Mahn:

The City of Plummer respectfully submits this application for an Idaho Community Development Block Grant. Our community has a thirty-five year old sewer system which has unfortunately served it's useful life.

Heavy inflow and infiltration combined with community growth has caused the system to reach capacity. During rainfall events and snow melt events, raw sewage bubbles out of our manholes and overflows our treatment facility directly to Plummer Creek. As you can imagine, the health and welfare of our citizens is compromised.

In addition, the EPA-Region 10 has issued a "Letter of Violation" and the Idaho Division of Environmental Quality has issued a sewer moratorium until we have a solution. This couldn't come at a worse time as the Coeur d'Alene Tribe is currently working on an 80 acre development that will include elderly housing, industry, meeting facilities and an RV park. Without solving our sewer crisis, they cannot connect to our system.

Therefore, we respectfully submit this request for a $500,000 ICDBG grant to supplement our $140,600 local match and $2,311,750 federal assistance (IHS, EPA, USDA-RD) to allow us to provide our 863 residents (63% LMI) with a sewer collection and treatment system which will provide for their health and welfare and allow for the continued economic growth of this small Idaho community. Thank you for your consideration.

Yours truly,

Harold Whitley, Mayor
City of Plummer

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D. APPLICATION INFORMATION - RULE 074.04

IDAHO COMMUNITY DEVELOPMENT BLOCK GRANT

Applicant:	***CITY OF PLUMMER***	Address:	***P.O. Box B, Plummer, ID 83851*** ***Benewah County, Idaho***
Chief Elected Official:	***Harold Whitley, Mayor***	Phone:	***(208) 686-1641***
Application Prepared By: Address:	***Wyatt Engineering, Inc.*** ***1220 N. Howard*** ***Spokane, WA 99201***	Phone:	***(509) 328-5139***
Architect/Engineer/Planner: Address:	***Wyatt Engineering, Inc.*** ***1220 N. Howard,*** ***Spokane, WA 99201***	Phone:	***(509) 328-5139***

NATIONAL OBJECTIVES: (please circle)		PROJECT CATEGORY: (please circle)		PROJECT FINANCING: (fill in)	
LMI	*X*	Public Facility	*X*	ICDBG:	$ 500,000
				Local:	$ 140,600
Slum and Blight		Housing		State:	
				Federal:	$2,311,750
Imminent Threat		Economic Development		Private:	
				Other:	
				TOTAL:	***$2,952,350***

Note: Send two (2) copies of all applications to Department of Commerce and one (1) copy to your regional Economic Advisory Council member. Attach Project Maps and LMI Survey Maps in Appendix.

Project Area Population: **863** Project Area LMI Population: **544 (63%)**

1. Have any land, buildings easements or right-of-ways been purchased for this project? Yes ____ No __X__
   How? ____________ Date ____________
2. Is anyone living on the land or in the structures at the proposed site? Yes ____ No __X__
3. Is any business being conducted on the land or in the structures at the proposed site? Yes ____ No __X__

DETAILED PROJECT DESCRIPTION:

Sewer system improvements including the replacement of manholes, collection lines and service lines to reduce the excessive inflow and infiltration (I/I) going into the sewer system and treatment facility during runoff and rainfall events. In addition, the improvements will include upgrading the 35 year old wastewater treatment facility. Even with the I/I removal, this facility is beyond it's original design capacity and cannot meet it's current discharge permit. This project will provide a response to the EPA "Letter of Violation"; will allow the Idaho Division of Environmental Quality (IDEQ) to lift their sewer moratorium ; and will cease the overflow of raw sewage into Plummer Creek.

DESCRIBE LOCAL MATCHING FUNDS:

The City has committed $89,600 cash toward the project and has completed $47,000 in inflow and infiltration removal on the current system. In addition, the City has expended $7,500 for planning activities and facility plan preparation.

APPLICATION CERTIFICATION:

The data in this application is true and correct. This document has been duly authorized by the governing body of the city or county and the city or county will comply with all required certifications, law and regulations if the application is approved and selected for funding.

Name (Typed): ***Harold Whitley*** Title: ***Mayor***

Signature: ____________________ Date: ____________________

E. THRESHOLD FACTORS - SECTION 074.05

Eligible Applicant:

The City of Plummer is an incorporated city in the State of Idaho with a population of less than 50,000 and therefore qualifies as an eligible applicant under Idaho Community Development Block Grant 2000 Administrative Rules (IDAPA 48.01.01) Section 012.

Eligible Activity:

The planning, administration, construction and installation of public works facilities to benefit a majority of LMI persons in a project area qualifies as an eligible activity under the following Sections:

***024* – Public Facilities and Improvements**
***039* – Administrative Activities**

The project also meets the State of Idaho objective of improving community infrastructure to encourage additional housing and economic development in communities.

The requested grant will provide for a portion of the funds needed to construct the project as outlined in this application. Due to economic growth pressures, it is incumbent upon the City to repair and upgrade our wastewater collection and treatment facilities.

Administrative Capacity:

An elected Mayor and four councilpersons govern the City of Plummer and employ a city staff of sixteen full and part-time persons, including a full-time City Clerk/Treasurer, Deputy Clerk and public works employees. Firefighting services are provided by the Gateway Fire District and police protection is provided by a city police officer, the Benewah County Sheriff's Department and the Coeur d'Alene Tribe.

The City has, after following the appropriate procurement practices, hired an Idaho Department of Commerce approved grant administrator to assist in the making of this application as well as a project engineer to make preliminary design and cost estimates as well as to create final construction documents. The administrator and engineer will, upon award of this grant, provide additional services for administration and construction of the proposed improvements.

Public Participation:

As required by Section 074.05(c), a Citizen Participation Plan has been adopted by the City and, in accordance with the plan and as required by Section 074.05(d). A Notice of Public Hearing was published in the local newspaper more than seven (7) days prior to the public hearing held October 26, 2000 to receive written and oral comments on the public's perception of the project and to review this application.

Dates of Publication of Public Notice:	*October18, 2000*
Date of Public Hearing:	*October 26, 2000*

F. GENERAL PROJECT DESCRIPTION - SECTION 074.06

Community Description:

The City of Plummer is an incorporated City situated in northwest Benewah County, approximately 40 miles south of Coeur d'Alene. Access to Plummer is provided by State Highway 95 which joins Highway 5 in Plummer. The community is located on the Coeur d'Alene Indian Reservation with the economy historically being based on forest and agriculture. Major employers are the School District, the Coeur d'Alene Tribe , Pacific Northwest Fiber and soon the re-tooled Lumber Mill.

The town's population has grown from 610 in 1980 to 863 in 1994. The population in 1999 was estimated at 1113. In 14 years, the town's population grew by 41%. With continued expansion of Coeur d'Alene Tribal interests, Plummer expects to continue its growth at a rate of 3% annually.

Community Needs Assessment:

A town meeting was held on May 20, 1992 to assess community needs. This meeting was attended by over 50 people including representatives from the Idaho Department of Commerce, RECD, and IDEQ. Community needs including public facilities, public building, housing, transportation, education and recreation were all considered at this meeting. Public facility improvements of both the water and sewer systems were considered to be a critical priority by local residents. The original priority defined was the water system improvement and that priority has been addressed with recent projects.

Now the priority has shifted to a reliable sewer system.

The City of Plummer sewer system is overloaded by excessive inflow and infiltration (I/I). During rainstorms and spring melting, flows can jump from 100,000 gallons per day to in excess of 400,000 gallons per day. This volume cannot be handled by either the collection lines or by the treatment facility. The result is raw sewage flowing out of manholes and the treatment facility overflowing raw sewage directly to Plummer Creek. Both are an extreme health hazard for all residents of the City of Plummer.

These violations have caused the Idaho Division of Environmental Quality (IDEQ) to issue a sewer moratorium and not allow any new connections on the system until corrections are made. In addition to this moratorium, the City of Plummer has received notices of violation for repeated discharge from the treatment facility to Plummer Creek that are outside of the permit limits.

These moratoriums and violations could not come at a worse time for Plummer. The Coeur d'Alene tribal industrial area located in the southwest portion of town now includes the new Pacific Northwest Fiber facility to produce straw board. In addition, the old mill site is being re-tooled to allow a small log mill to begin operation. Finally, plans for the site include the opening of a new Ironman Safe manufacturing facility. All of these facilities provide jobs to the community.

In addition to these facilities, the Coeur d'Alene Tribal headquarters are now located in Plummer and they are now proceeding with development of 80 acres in the northwest corner of the community. The plans for this land include elderly housing, an RV park, museum, crafts shops, recreation areas, meeting grounds, and other uses. In addition to this development, a new business plaza is also being planned by the Coeur d'Alene Tribe which would create employment for 30 people and the Coeur d'Alene Tribal Housing Authority plans to build an average of 5 new homes each year for the foreseeable future.

With the sewer moratorium in place and violations commonplace, these projects cannot proceed and the health and welfare of all of the Plummer residents is in jeopardy. ***There is no stronger need to the Plummer community than correcting the sewer concerns.***

F. GENERAL PROJECT DESCRIPTION - SECTION 074.06 (cont.)

Project Description:

The older portion of the collection system where the I/I problem exists was constructed in the early 1960's and is constructed of eight inch diameter concrete pipe and cider block manholes. In 1995, an I/I study was completed on the sewer system which confirmed that I/I flows caused system flows to fluctuate between 80,000 gallons per day to 450,000 gallons per day with rainfall and snowmelt events.

Corrections were made in a 1996-1997 CDBG project. The success of this project was confirmed by IDEQ which stated in their 1999 Annual Report dated 2/2/00 that

> *"...we noted a dramatic decrease in flow into the treatment facility from 58.7 million gallons in 1998 to 42.5 million gallons last year.....we compliment the city on the success of these efforts"*

The Indian Health Service (IHS) completed its Plummer Community Sewer Systems Condition Report in February 2000, concluding that major improvements to the sewer systems are required for the continued good health of those residing and working in and around the City of Plummer. The report indicated that the City's wastewater treatment facilities are still overloaded due to inflow and infiltration (I&I) into the collection system. Identified improvements include manhole repair and replacement; sewer line replacement; service line replacement; roadway repair; and cleaning and video inspection of the sewer lines.

In addition, Wyatt Engineering completed a Wastewater Treatment and Disposal Facilities Plan in November of 2000. This plan concluded that even with I/I removal success, continued community growth along with changing discharge permit criteria into Plummer Creek would require a significant improvement to the existing treatment and disposal facility to achieve all goals. After review of several alternatives, the selected alternative was to expand land application area to the system for additional disposal; line the existing treatment lagoons to minimize seepage into the groundwater; and construction of additional treatment lagoons to provide detention time and needed capacity.

The I/I collection project improvements will be completed in two phases. The first phase incorporates an initial scope of work to address the most severe I&I problem spots and the engineering for the system's reconfiguration with the second phase correcting the remainder of the identified deficiencies. The project will include over 11,000 feet of sewer line replacement; 65 manholes either repaired or replaced; new service lines and connections; and video inspection and cleaning. This project is projected to begin construction in the summer of 2001 and be completed by the fall of 2001.

The treatment and disposal project will be completed after the I/I work has been done. This project will include adding new aeration, chlorination and filter cells; new building facilities; additional land application land and equipment; and lining the existing treatment cells. The project schedule is to complete the design in the summer and winter of 2001 and begin construction in the spring of 2002.

The sewer system improvements sought under this grant are those necessary to bring the community into agreement with current health and operation standards, to increase the capacity of the existing lagoons and to preclude overflowing of untreated effluent into Plummer Creek.

Cost estimates, vicinity maps and site maps for these projects are included in the appendix.

F. GENERAL PROJECT DESCRIPTION - SECTION 074.06(cont.)

Benefits of the Project:

Environmental Benefits: Critical problems with Plummer's sewer system include inflow and infiltration from rain water and snow melt which greatly overloads the treatment lagoons. This causes the lagoons to overflow which greatly shortens the treatment cycle and leads to large quantities of raw or partially treated effluent going into the creek and subsequently to Lake Coeur d'Alene. It has been said that the lower end of the lake is devoid of any game fish and plant life is limited to that which can survive in a virtually "dead" lake. It is possible the problem with the City of Plummer sewage system is contributing to this condition.

Economic Benefits: Additionally, improvements to the City's infrastructure system will help local businesses with future expansion plans and make Plummer a more attractive community for economic development (unemployment in Benewah County is 13.4% versus the statewide average of 6.6%). Continued expansion by the Coeur d'Alene Tribe, and the Tribal Housing Authority will bring additional new jobs to the City of Plummer. This will create new demands on a sewer system which is already critically deficient and at times virtually inoperative.

Regionalization Benefit: Without this project, the Coeur d'Alene tribal expansion cannot connect to the City of Plummer system due to the IDEQ moratorium. If this occurs, the Tribe has indicated that one potential solution would be to create a separate sewer and water system to handle only the tribal interests. This would create two proximate systems and would still leave Plummer without a solution. The benefit of this project would be to eliminate the need for a redundant system and regionalize the sewer collection and treatment needs.

National Objective: The project complies with the National Objective of developing viable communities by expanding economic opportunities and providing decent housing for persons of low and moderate incomes. The proposed activities specifically address the immediate sewer moratorium and raw sewage discharges to Plummer Creek both of which "*pose a serious and immediate threat to the health and welfare of the community where other financial resources are not available to meet such needs*".

State Objective: The project complies with State Objectives of the ICDBG program by assisting an Idaho community to make it possible for the City of Plummer to improve their infrastructure, develop their tax base and to provide growth opportunities. As stated above, the project will eliminate health and safety problems caused by the raw sewage discharges to Plummer Creek and the overflowing manholes after a rainfall or snow melt event. This project will principally benefit low and moderate income citizens through:

1. Improving community infrastructure to accommodate economic growth and eliminate health and safety problems through updating the sewer system in a city that is 63% LMI.

2. Providing for potential additional opportunities created by an infrastructure that allows for business expansion.

3. Improving the possibilities for economic viability of a town which, along with other small towns is excited about growth in their area of Idaho.

4. The project will also provide to the area the short term economic benefit of a public works project through its attendant payroll and material supply requirements.

Each of these benefits and objectives will be addressed by this project which is to be funded by a combination of City, IHS, EPA, USDA-RD and CDBG funds.

G. Budget

Community Development Project Budget

Applicant or Grantee: *City of Plummer* Project Name: *Plummer Wastewater System Improvement Project*

LINE ITEMS	ICDBG Cash	City Cash	City In Kind	Indian Health Services	EPA CWA-ISA	USDA-RD NA-SAF	Private Cash	Private In Kind	Other Cash	Other In Kind	Total
Administrative Expenses/Publications**	$20,000					$22,500					$42,500
Project Planning & Design			$7,500								$7,500
Land, Structures, Rights of Way						$30,000					$30,000
Architectural/Engineering Base Fees		$6,000	$5,000	$52,000	$31,250	$173,750					$268,000
Inspection Fees			$6,600	$58,000	$31,250	$173,750					$269,600
Relocation Expenses											
Relocation Payments to Businesses & Individuals											
Demolition & Removal											
Construction & Project Improvements	$480,000	$78,000	$35,500	$270,000	$126,600	$1,337,150					$2,327,250
Legal						$5,500					$5,500
Audit		$2,000									$2,000
TOTAL COSTS**	$500,000	$86,000	$54,600	$380,000	$189,100	$1,742,650					$2,952,350

*Identify funding source.

**Administrative expenses and project planning design costs, when totaled, shall not exceed 10% of the total ICDBG amount.

H. ASSURANCES - SECTION 074.08

In the event we, the City of Plummer, should receive a Community Development Block Grant, we certify we will comply with the requirements of:

- National Environmental Policy Act of 1969
- Civil Rights Act of 1964 Pub.L. 88-352
- Civil Rights Act of 1968 Pub.L. 90-284
- Age Discrimination Act of 1975
- Rehabilitation Act of 1973, Section 504
- Uniform Relocation Assistance and Real Property Acquisition Act of 1970, as amended (49 CFR Part 24)
- Housing and Community Development Act of 1974, as amended Pub.L. 93-383
- Davis Bacon Act (40 USC 276a-276a-5)
- Historic Preservation Act
- Section 106 of the Housing and Urban Recovery Act of 1983 certifying to:
  - Minimize displacement as a result of activities assisted with CDBG funds; and adopt and follow a residential anti-displacement and relocation assistance plan.
  - Conduct and administer its program in conformance with Title VI and Title VII, and affirmatively furthering fair housing.
  - Provide opportunities for citizen participation comparable to the State's requirements (those described in Section 104(a) of the Act, as amended).
  - Not use assessments or fees to recover the capital costs of CDBG-funded public improvements form low and moderate income owner occupants.
  - Abide by all State and Federal rules and regulations related to the implementation and management of Federal grants.
  - Assess and implement a Handicapped Accessibility Plan in accordance with Section 504 of the Rehabilitation Ace of 1973, as amended.
  - Adopt and implement an Excessive Force Policy.
  - Adopt and abide by the Anti-Lobbying Certification.
  - Prohibition of Use of Assistance for Employment Relocation, Section 588 of the Disability Housing and Work Responsibility Act of 1998 Pub. L 105-276

____________________________ ________________

Signed by Chief Elected Official Date

Harold Whitley, Mayor
Typed Name

I. Rating and Ranking Criteria – Section 083

Following is a summary of the matching fund sources and commitments. Letters from each agency are provided in the Appendix. In addition, Ernest Stensgar, the Coeur d'Alene Tribal Chairmain , has provided a letter of support and a letter requesting that the available Indian Set Aside moneys be utilized for this project.

Source	Amount
City Cash	$ 86,000
City In-Kind Match	$ 54,600
Indian Health Service	$ 380,000
EPA-Indian Set Aside	$ 189,100
USDA-RD - NA Set Aside	$1,742,650
TOTAL MATCH FUNDS	**$2,452,350**

i. **Program Impact (320 Points) - Section 084.**

A. Percentage of ICDBG dollars in total project (50 Points)

*$500,000 ÷ $2,952,350 = **16.9%***

B. Percentage of Local Matching Funds as a percentage of local match + CDBG (60 points) (Note: For each $1.00 in cash on hand, use $1.50 for calculation)

Local Cash Multiplier	$86,000	x	1.5	=	$129,000
Adjusted Local Match	$129,000	+	$54,600	=	$183,600

*$183,600 ÷ ($500,000 + $140,600) = **28.7%***

C. ICDBG Dollars per Person (50 points)
ICDBG dollars divided by total persons directly benefitted by the project = ICDBG dollars per person

*$500,000 ÷ 863 = **$579.37** Dollars Per Person*

D. Local Matching Funds per Person (60 points)
Local matching funds divided by total persons directly benefitted by the project = dollars per person (Note: for each $1.00 in cash on hand, use $1.50 for calculation)

*$183,600 ÷ 863 = **$212.75** Dollars Per Person*

E. Eligible Activity Point Form (100 points)
(See eligible activity point form on the following page.)

F. Environmental Considerations: List environmental impacts and any mitigating factors.

None of the proposed work should have any lasting detrimental impact to the environment. Quite the contrary. Currently, the sewer collection and treatment system cannot handle the existing flows which causes raw sewage to flow out of the manholes and treatment facility directly to Plummer Creek. This situation will be remedied with this project. There will be temporary impacts (dust, noise, etc) during construction and a JARPA permit is anticipated for work near Plummer Creek. Additional permitting will include an amendment to the Land Application permit (WLAP) and a revised NPDES permit.

ELIGIBLE ACTIVITIES POINT FORM - SECTION 084.05

IDAHO COMMUNITY DEVELOPMENT BLOCK GRANT
PART OF RATING AND RANKING CRITERIA - PROGRAM IMPACT ITEM E

TOTAL ICDBG FUNDS REQUESTED $ 500,000

SECTION NO.	ELIGIBLE ACTIVITY	ICDBG $ ALLOCATED	% OF TOTAL ICDBG REQ	POINT VALUE	TOTAL POINTS
023.	Acquisition of Real Property			25	
023.	Acq. Real Property for Housing			50	
024.	Public Facilities & Improvements				
	-Health/Safety Related	$480,000.00	96.0%	100	96
	-Housing Related			75	
	-Social Service			50	
	Engineering			75	
025.	Code Enforcement			50	
026.	Clear/Demolition			10	
027.	Removal of Architectural Barriers			50	
028.	Rental Income Payments			0	
033.	Disposition Property			10	
034.	Public Services			0	
036.	Completion of Urban Renewal Projects			0	
037.	Relocation Payments			25	
038.	Planning Activities			0	
039.	Administrative Activities	$20,000.00	4.0%	100	4
040.	Grants to Nonprofit Community Orgs.			0	
045.	Grants to Nonprofit Orgs for Housing Project			75	
046.	Energy Planning			0	
051.	Housing Rehabilitation			75	
TOTALS		$500,000.00		100%	100

I. PUBLIC FACILITIES RATING AND RANKING CRITERIA - SECTION 085

ii. National Objectives – Section 085

(choose either the benefit to LMI persons **or** the prevention and elimination of slum and blight)

OPTION ONE – LMI persons

BENEFIT TO LOW AND MODERATE INCOME PERSONS (Section 085.01)

Area Benefit Activities ___X___
Limited Clientele Activities ______
Housing Activities ______

Calculate percentage of LMI households below:
Total # of LMI persons ÷ Total # of persons = Percentage of LMI

544 LMI persons ÷ 863 Total persons = 63% LMI

How were LMI persons determined? Survey ___X___ Census Data _____

*Note: Attach survey report i.e., sample survey, description of the methodology used, and Survey Tabulation Form, project maps, etc. (See Survey Methodology Appendix 6)

Need and Impact

Describe all the needs of LMI persons (80 points).

In 1992 at public meeting held to complete a community needs assessment for Plummer, called for the immediate attention to health, safety and welfare standards for all community infrastructure. Critical public facility projects were listed for Plummer and the foremost were infrastructure projects related to water and sewer.

On April 28, 1998, Region 10 of the EPA issued a *Warning Letter* regarding the wastewater treatment facility being out of compliance due to excessive discharge of raw or partially treated wastewater to Plummer Creek. A second letter was issued on March 5, 1999 and an official "*Letter of Violation*" was issued on 4/15/99. Continued violation has already resulted in a sewer moratorium by IDEQ and may result in substantial fines to the City of Plummer.

This violation letter alone defines the critical need of the LMI persons and confirms that the existing system jeopardizes the health, safety and welfare of all residents of Plummer.

The City of Plummer is actively at work managing the growing influx of persons and businesses into the community. While much of the growth has been in the south east section of the city with ever enlarging Indian housing, the older part of town west of the railroad tracks is also being developed by the Coeur d'Alene Tribe with a new 80 acre mixed use development.

By potentially limiting residential and economic growth, the LMI households are directly affected by the potential loss of jobs related to the loss of such developments. This is critical as Benewah County's unemployment rate continues to decline with the county having almost 14 percent unemployment in October of 1998.

I. PUBLIC FACILITIES RATING AND RANKING CRITERIA - SECTION 085 (cont.)

Describe how the project will impact the LMI needs:

Specific project activities to meet the needs of 63% LMI population include the reduction of infiltration and inflow into the sewer system and the improvement and expansion of the treatment and disposal facility. By reducing the I/I, system capacity will be regained and the overflowing of the manholes and treatment facility will be remedied. By increasing the capacity of the treatment facility, remaining flows and future flows can be treated and disposed to meet the established NPDES discharge permit.

These projects will directly impact the health, safety and welfare concerns which have been documented by three extensive engineering studies and further by the "*Letter of Violation*" given to Plummer by EPA Region 10. Finally, completion of this project will allow the lifting of the IDEQ sewer moratorium.

In addition, LMI households will benefit through improved community infrastructure which will accommodate future economic growth. The long term impact to LMI households will be the construction of a dependable sanitary sewer system which will meet their needs.

iii. **Project Categories (Section 090.01)**
Planning, Previous Action and Schedule (160 points)

Describe Planning:

The following steps have been taken in the planning process:

1. Problem Identification: The City has known of their sewer problems for some time. However, problems with the system are beyond the ability of the City to correct utilizing local resources alone. Through town meetings, public hearings and city council meetings, the problems with the sewer system have been identified as a major concern to local residents.

2. The City of Plummer previously hired Hamilton and Voeller to perform a sewer system analysis. In 1994, the City retained Wyatt Engineering to assist a team of Gonzaga University School of Engineering to prepare a wastewater collection system analysis. In 2000, the Indian Health Service completed an additional Sewer System Condition Report to identify the remaining I/I concerns. Finally, the City retained Wyatt Engineering in September 2000 to complete a Wastewater Facilities Plan on the existing treatment and disposal systems.

3. Public Involvement: A public meeting was held in May 1992 to complete a community needs assessment. Personnel from IDOC, RECD, and IDEQ were in attendance. Over 50 residents attended this meeting during which it was determined that the water and sewer system problems were major concerns. This public hearing began the process to look for ways to finance the needed water and wastewater sewer system improvements.

4. In August of 2000, a meeting was held at Plummer. In attendance were representatives from the Coeur d'Alene Tribe, Indian Health Service, Wyatt Engineering, and the City of Plummer. The purpose of the meeting was to review the concerns of the CDA Tribe regarding potential limitations regarding growth due to the failing sewer system. At this meeting financial commitments were addressed and a decision was made to proceed with a CDBG application.

I. PUBLIC FACILITIES RATING AND RANKING CRITERIA - SECTION 085 (cont.)

Describe Planning: (Cont.)

5. Agency Involvement: The Idaho Department of Environmental Quality supports the recommendations outlined in the Wastewater Facilities Plan as well as the overall project. EPA also supports our efforts. Both support the need to preclude degradation of sewer effluent going into Plummer Creek and on to Coeur d'Alene Lake.

6. The City has selected Wyatt Engineering, Inc. for engineering services as well as grant writing and administration services. All procurement requirements were followed in the selection process.

7. The City has $86,000 in cash in a reserve fund and has completed an in kind I/I removal project totaling $47,000. Finally, the City has retained Wyatt Engineering to complete a wastewater facilities plan at a cost of $7,500.

8. The City has adopted a Public Participation Plan and a comprehensive planning committee made up of City Council members and residents will continue to monitor the project.

9. The City completed a sewer rate study in October of 2000 and the sewer rates were adjusted to reflect the changing financial needs of the sewer system. These needs included preparing a capital improvement reserve fund to provide the local cash match for this project.

Describe Previous Actions:

The following previous planning actions have been accomplished:

1. The City, at its own expense, has twice hired consulting engineers to prepare a sewer system engineering report. In addition, the City has hired Wyatt Engineering to complete a Wastewater Treatment and Disposal Facility Plan. This plan was completed in November of 2000 and includes a detailed scope of work, cost estimates, and project schedule.

2. The Indian Health Services has completed a Sewer System Condition Report. This report identifies the collection system problems and outlines recommendations for correction. This report includes a detailed scope of work, cost estimate, and project schedule.

3. The City's matching funds for the project are committed. The City council entered into an agreement with the Indian Health Service to contribute $86,000 of cash from the sewer reserve funds to support the I/I problems outlined in the IHS report described in item #2 above. In addition the City has completed $47,000 in I/I removal projects and have spent $7,500 on a Wastewater Treatment and Disposal Facility Plan.

4. Agency matching funds for the project are committed. The IHS has provided a letter of commitment providing $380,000 for the project. These funds will be available after the Sewer Deficiency Survey (SDS) list is completed in January of 2001. The Environmental Protection Agency - Region 10 has provided a letter of commitment providing $189,100 for the project. Finally, USDA-RD has provided a letter committing funds from the RD Native American Set-aside Funds. These funds have been officially requested by Ernest Stensgar, the Tribal Chairman of the Coeur d'Alene Tribe in the letter that is attached in the appendix. The total amount of the USDA-RD funds will be $1,742,650.

I. PUBLIC FACILITIES RATING AND RANKING CRITERIA - (continued)

Describe Previous Actions: (Cont.)

5. The City of Plummer issued Requests for Proposals for administration and engineering of this wastewater system improvement project. In November, the City selected Wyatt Engineering to provide both the grant administration and engineering on the project. In addition, Wyatt Engineering was retained to complete a Wastewater Treatment and Disposal Facilities Plan to identify improvements to the treatment and disposal facilities to bring them into compliance with future flows and discharge permits.

6. The City Council has recently approved increases to the base sewer rates and the commercial sewer rates. The new commercial rate structure is based on water usage.

With the above actions, the City can insure that the construction of the sewer system improvements can begin in a reasonable time after the CDBG grant is awarded and that construction will be completed on the I/I project by the end of 2001.

iv. Detailed cost analysis (½ page) (40 points). See Rule Section 090.02.

Have costs been established by an engineer or architect? Yes X No ______
Have all costs been included, i.e. Davis-Bacon? Yes X No ______

A detailed cost estimate has been prepared by Wyatt Engineering and the Indian Health Service. A combination of these estimates have been compiled and are included in the appendix.

Plummer has committed $140,600 to the project from sewer reserve funds. In a community with 63% LMI persons which is economically depressed, the City council and residents have determined that this is the maximum amount which the residents could afford through rate increases.

v. Certified Gem Communities (20 points). See Rule Section 090.03.

The Plummer Community Action Team was formed out of the GEM Community Committee to carry forth the original goals and projects. The group has changed membership over the years and has completed some of the projects, with many of them continuing. We meet monthly to conduct regular business. We intend to complete an updated GEM plan for the Department of Commerce in November of 2000.

We have a small membership. Out most recent large activity has been to open the Plummer Visitor Center this spring. It is open 20 hours per week on a year-round basis. The Center offers tourists information about the area, Idaho, and surrounding states. Several items are offered for sale at the Center, which help keep it going. A community access computer is available for the public to use for Internet access, work-processing, or other various activities. This summer we helped sponsor Internet classes for the public. We have also completed a draft Business Directory that will be completed soon and available to the public. New entrance signs for Plummer have also been completed; we are currently waiting on permits through the State Transportation Department to place them.

Our goals are to continue promoting Plummer through a community web page, supporting and promoting local businesses, providing free and low-cost computer education to the public, continuing to sponsor Clean Sweep Day, and continue operations at the Visitor Information Center.

Financial Viability Profile For Water And Sewer System Improvements

I. Type of organization: (check one) Water ____ Sewer _X_

(circle one)

Municipality Water and/or Sewer District Non-Profit Company
For-Profit Company Homeowner's Association
Other (Explain) ____________________

II. System

A. Briefly describe the geographic area to which you supply services:
The City of Plummer is located in Benewah County and is located approximately 32 miles south of Coeur d'Alene, Idaho along US Highway 95. Service is provided to the entire community within the community boundaries of approximately 1 square mile.

B. Source of water or sewage treatment method:
Sewage is treated by an aerated lagoon system. The effluent is disinfected and discharged to a land application area during the growing season. During winter months, the effluent is chlorinated and then discharged to Plummer Creek after polishing in a sand filter. This discharge can only occur when the flows in Plummer creek exceed 1.5 cfs and the dilution rate is at least 10:1.

C. Number of people served: *990 current residents*

D. Number of hook-ups on system: *399 connections*
Approximate number of residential hook-ups: *345 connections*
Approximate number of commercial hook-ups: *54 connections*
Approximate number of industrial hook-ups: *na*

E. On average, how much water is provided/treated per day: *150,000 gpd*

F. Does your organization have certified operators certified by EPA/DEQ: *Yes*

III. User Rates:

A. How are user rates charged: (circle one)
Per hookup (residential) ***Per volume used(commercial)*** Other (explain)

B. Current water and sewer user rates: $ *17.00* per *connection*
If graduated or progressive rate structure, or different rates for different classes of users, please attach a separate explanation.) **See attached schedule**

C. When was the last rating change? *October 1, 2000*

D. Does your organization measure water use: Yes _X_ No ____
If yes: (circle one) ***Meters at user hook-ups*** Master Meter
Other____________________

E. Are testing practices in compliance with DEQ:
Yes _X_ No ____

F. Does your organization have a reserve fund:
Yes _X_ No ____

G. Does your organization have an assessment for some future special need:
Yes ____ No _X_
If yes, for what purpose and explain how it is assessed:____________________

H. Reserve fund balance: *$25,856 is in the Sewer Reserve Fund*

IV. Financial Condition:

A. Annual revenues

For customers though rates	$ *93,900*
From other sources (Explain)	$ *2,000 Crop Revenue*
Total Annual Revenues	$ *95,900*

B. Annual expenses

For operations and maintenance	$ *22,195*
For personnel	$ *27,245*
For overhead (office, legal, etc.)	$ *33,309*
For debt service	
Federal (agency or program)________	$ *0*
State (agency or program)________	$ *0*
Private (company)________	$ *0*
For other *Reserve Fund*	$ *13,151*
Total Annual Expense	$ *95,900*

C. Value and description of assets ***Sewer Plant)***

Land	$ *0*
Buildings	$ *231,300*
Waterworks	$ *0*
Equipment	$ *62,929*
Reserve Funds	$ *25,856*
Other	$ *0*
Total Asset Value	$ *320,085*

D. Outstanding indebtedness: ***No outstanding debt***

	Years remaining	Annual payment	Whom to
Bonds	0	0	na
Loans	0	0	na
Other	0	0	na

V. Future needs (List any projects which need to be done within the next five years.)

Description	$ Amount	Purpose (Renovation, Expansion Water quality, Supply, Etc.)	Priority
I/I Removal	*$ 916,500*	*Renovation*	*1*
Treatment/Disposal	*$1,933,000*	*Renovation*	*2*

VI. List two most vulnerable pieces of equipment (potentially subject to failure due to age, damage, out of compliance).

1. ***Treatment Lagoons*** - Old age has allowed excessive I/I to reach the system and overload the treatment and disposal facilities. This overloading has caused release of raw effluent into Plummer Creek and has resulted in a Letter of Violation from EPA. This system routinely fails and will continue to worsen as flows increase.

2. ***Effluent Disposal System*** - Due to the excessive flows, the land application area is too small to treat the increased effluent volume. Early spring flows has resulted in release of wastewater effluent on the land while it is still saturated. In addition, the permit limits outlined in the NPDES permit could change. If new limits were imposed which would not allow discharge into Plummer Creek, then the system could not function in the late fall through spring months without violations.

PROJECT SCHEDULE AND ACTIVITY SUMMARY

PROJECT ACTIVITY	Date Completed	Date to be Completed
Grant Writer Procured	November 2000	
Grant Write Contracted		November 2000
Engineering/Architect Procured	November 2000	
Engineering/Architect Contracted		November 2000
Appraiser Secured		November 2001
Acquisition & Relocation Notices Sent		December 2001
Other Agency Apps. Submitted		November 2000
Legal Services Secured	On-Going	
Bond Election Held	N/A	
Bonds Sold or Financing Secured	N/A	
National Objective Documentation Complete (LMI)	1992 (LMI Survey)	
Levy/Fee/Rates Review	October 2000	
Facility/Property Inventory	October 2000	
Reserve Fund Established	October 2000	
Project Maps Drawn	Feb & Nov 2000	
DEQ Facility Plan	November 2000	
Prelim. Engineering/Architect Plan Completed	November 2000	
Permits Identified & Approvals Secured		December 2000
Energy Efficiency Checks	N/A	
Zoning Permits Secured	N/A	
Fees & Special Assessments Identified	N/A	
Application Drafted	October 2000	
Submit Application	November 2000	
First Public Hearing Held	October 2000	
Fire Rating Class Scores	N/A	
State Fire Marshall Reporting	N/A	
Other Agency Approvals	November 2000	
Local Match Secured	Oct-Nov 2000	
Addendum Submitted		March 2001
Grant Award		April 2001
Program Income Reviewed	N/A	
Acquisition Complete and Deed Filed		February 2002
Environmental Review Officer Appointed		April 2001
Environment Review Complete		April 2001
FONSI Published		April 2001
Environmental Release		April 2001
Historic Preservation Cleared		May 2001
Asbestos/Lead Paint Removal Determined	N/A	
Other Environmental Conditions: Reviewed/Permits		June 2001
Demolition Begins	N/A	

PROJECT ACTIVITY	Date Completed	Date to be Completed
Relocation	N/A	
Adoption/Notification of 504 Grievance		April 2001
Adoption/Publication of 504 Policy		May 2001
Establish 504 Review Committee		May 2001
Complete 504 Self Evaluation & Transition Plan		May 2001
Establish Fair Housing Committee		May 2001
Adoption/Notification of Fair Housing Policy		May 2001
Fair Housing Assessment Complete		July 2001
Bid Document Approval		June 2001/Feb. 2002
Final Engineering/Architect Design Approved		July 2001/March 2002
MBE/WBE Solicitation		July 2001
Bids Advertised		July 2001/March 2002
Opening Bids		July 2001/March 2002
Debarred Check		July 2001/March 2002
Hold Preconstruction Conference		July 2001/March 2002
Civil Rights Requirements Completed		July 2001/March 2002
Notice of Bid Award		July 2001/March 2002
Start Construction		Aug 2001/April 2002
Second Public Hearing		September 2001
Construction 25% Complete		Sept 2001/May 2002
Construction 50% Complete		Oct. 2001/July 2002
Construction 75% Complete		Nov. 2001/Sept. 2002
Construction Complete		Dec. 2001/Dec. 2002
Certificate of Substantial Completion Issued		Dec. 2001/Dec. 2002
Monitoring Visit		November 2001
Final Report		Dec. 2001/Dec. 2002
Closeout		Jan. 2002/Jan. 2003
Accounting & Audits		Jan. 2002/Jan. 2003

NAME OF PROFESSIONAL AND AGENCY CONTACTS	FIRM/AGENCY	PHONE	TOPIC
Wyatt Engineering, Inc.	Jeffrey N. Logan, P.E.	(509) 328-5139	Design
Wyatt Engineering, Inc.	D. Richard Wyatt, P.E.	(209) 746-2661	Administration
Coeur d'Alene Tribe	Ernest Stensgar	(208) 686-1800	Need
Coeur d'Alene Tribe	Wally Hubbard	(208) 686-1800	Need
Indian Health Service	Mark Fleetwood	(509) 484-9341	Funding
EPA - Region 10	Geoff Keeler, P.E.	(206) 553-1089	Funding
USDA-RD	Mac Cavasar	(208) 667-2833	Funding
IDEQ	Gary Gaffney, P.E.	(208) 769-1422	Environment
Dept. of Commerce	Jerry Miller	(208) 334-2470	Grants

I. PUBLIC FACILITIES RATING AND RANKING CRITERIA - SECTION 091

iv. Economic Advisory Council Points (Section 091) (200 points):

Describe the Community's ability to finance the project with pure local matching funds: local effort and commitment; the project's local and regional economic impact.

The Block Grant program is the only viable funding option to the City to finance the proposed sewer infiltration/inflow reduction project and the treatment/disposal project. Plummer has raised their sewer rates in 1999 and raised them an additional $2/month in October of 2000. To leverage $500,000 of additional local matching funds would increase the monthly bill by almost $5.50/month! ($500,000 over 20 years at 5% annual interest and 400 connections) In a community with 63% LMI persons and which is economically depressed (14% county unemployment), residents simply cannot afford another significant increase in utility rates. After addressing citizen concerns about the increase in user rates, the City Council determined that $140,600 from reserve funds ($86,000 in cash match plus $54,600 in an I/I removal project and a wastewater facility plan) is the maximum amount that residents could afford to fund. These committed reserve funds are a result of the recent rate increases.

As discussed in the Previous Action section of the application, all possible measures have been taken to ensure that construction can begin as soon as the CDBG grant awards are announced. Local matching funds for the project have been secured and the project team selections complete. In addition, the numerous funding partners (IHS, EPA, USDA-RD) are all excited about the project and have committed their resources. This project is ready to go!

The impact of a successful Block Grant application will protect the health, safety and economy of the community by:

1. Preventing presently overflowing surcharged manholes from pouring excess rain water mixed with sanitary sewer flows out on to the city's streets

2. Preventing sewer lagoon overflow which goes into a creek that flows to Lake Coeur d'Alene

3. ***Respond to the EPA "Letter of Violation" and removal of the IDEQ sewer moratorium by meeting the NPDES permit requirements.***

Local economic impact: With the sewer moratorium lifted, additional business and home expansions planned as part of the Coeur d'Alene Tribe development on the north side of Plummer can proceed. This 80 acre project will create new jobs in Plummer and will allow the building of new homes (approximately 10 every other year) by the Coeur d'Alene Tribal Housing Authority, along with enhancing the potential for the community's future economic growth.

Regional Impact: The Coeur d'Alene Tribe has indicated that if this project cannot be funded that they may have to construct their own wastewater facility to treat the water from their new development. This would remove an important funding source from the City of Plummer in trying to improve their existing system. It would also create a redundant system while leaving Plummer's in a state of disrepair. By working together, all goals can be met and the health, safety and welfare of all of the Plummer citizens can be maintained and improved.

This project is a major undertaking brought on by the continuing interest of the Coeur d'Alene Tribe. The City has taken several major steps toward the solution outlined in this application. They have worked with various agencies, IHS, EPA, RECD, DEQ and IDOC to insure they are exploring all possible solutions. While the City of Plummer has the ability to fund a portion of the proposed sewer system improvements, the total scope of work is out of their reach.

I. PUBLIC FACILITIES RATING AND RANKING CRITERIA - SECTION 091 (Cont.)

iv. Economic Advisory Council Points (Section 091) (200 points): (Cont.)

Describe any other benefits of the project or extenuating circumstances why this project should be funded.

The City of Plummer respectfully submits the following reasons why the Advisory Council should fund the proposed waste water system improvement project:

1. The critical health and safety concerns of the residents are the paramount issues in funding this application. The "*Letter of Violation*" from the EPA and the sewer moratorium imposed by the IDEQ define a critical need. These issues cannot be ignored for Plummer to remain a viable community!

2. If the project is not funded, the Coeur d'Alene Tribe may construct their own facility to support their development. This non-regional solution would remove an important funding partner from the project and would create a redundant system while the City of Plummer system continued to worsen.

3. Plummer has only two possible sources of funding (CDBG and bonds). The City cannot afford to again finance through bonds having recently done so for a major water improvement project. Plummer has raised sewer rates for the last two years to secure the reserve funds committed to this project. Plummer needs the CDBG or they will be forced to abandon the project.

4. The continued creation of new jobs in Plummer would be in serious jeopardy if this project is not undertaken. With the sewer moratorium in place, new connections (both residential and commercial) are not allowed. If new business cannot connect then they will not locate in Plummer. The City needs this requested block grant in order to undertake this project.

5. The City has twice, at its own expense, retained consulting engineering firms to prepare engineering reports on the sewer system. In addition, the IHS has completed a sewer system report and Wyatt Engineering has recently completed a Wastewater Treatment and Disposal Facility Plan. Upon notification of a successful block grant application, construction of the inflow and infiltration removal project is ready to proceed and will be completed by late 2001.

This project will not only improve the health and safety of residents by providing safe handling of sewage but permit newly developed property to be added to the tax roles and other property to be available for development. The commitment of the City to plan and expend City funds in advance of the approval of this block grant is an indication of their feeling for the ultimate necessity for this project. The renovation of the sewer system will allow the City to continue to encourage the further development of residential areas and local industrial expansion and thus position Plummer for gains in economic vitality. It will show the commitment of the City and the Department of Commerce to react to the growth in this part of the State of Idaho by improving infrastructure in Plummer and, subsequently, prepare for oncoming much needed growth in this community.

J. Appendix -Additional Information from Applicant (Section 074.10)

1. ***Vicinity and Project Maps***
    - a. Vicinity Map
    - b. Site Map
    - c. I/I Reduction Map - IHS
    - d. Treatment and Disposal Flow Diagram - Wyatt

2. ***Engineers Cost Estimate***

3. ***Letters and Articles***

    - a. Journal of Business - Information Article - 11/8/00
    - b. IHS Letter - Letter of Financial Commitment & Support - 11/15/00
    - c. IDEQ Letter - Letter of Support - 11/14/00
    - d. US-EPA Letter - Letter of Financial Commitment & Support - 11/14/00
    - e. City of Plummer Letter - Local Construction Match - 11/13/00
    - f. County of Benewah Letter - Letter of Support - 11/6/00
    - g. USDA-RD Letter - Letter of Pending Financial Commitment & Support - 11/3/00
    - h. Coeur d'Alene Tribe Letter - Letter of Support - 10/31/00
    - i. Coeur d'Alene Tribe Letter - Letter Requesting Financial Support - 10/31/00
    - j. IDEQ Letter - Moratorium Letter Reminder 9/19/00
    - k. IDEQ Letter - 1999 Annual Report (concurrence with I/I success) - 2/2/00
    - l. EPA Letter of Violation - Request for Information - 4/15/99
    - m. EPA 2nd Warning Letter - 3/15/99
    - n. EPA Warning Letter - 4/29/98
    - o. Coeur d'Alene Tribe Letter - April 29, 1993

4. ***Resolutions and Publications***

    - a. Citizens Participation Plan
    - b. Notice of Public Hearings
    - c. Public Hearing Minutes

5. ***Procurement Documentation***

6. ***LMI Survey Methodology and Survey Form***

7. ***Financial Viability Profile***

8. ***Sewer Rate Study***

APPENDIX II

1999-2002 Flow Monitoring Data

City Of Plummer Month of [redacted] Jan 1999
Jan 1999

Date	Weather	Temp (F)	Temp. Pond 1	Temp. Pond 2	PH Pond 1	PH Pond 2	DO Pond 1	DO Pond 2	Feed Rate Lbs/day	Residual mg/l	Influent (MGD)	Mix Hrs Pond 1	Mix Hrs Pond 2	Flow (MGD) Effluent
1														
2											0.108			
3											0.149			
4	Cloudy	18				6.62		13	5	0.74	0.143	80	55	0.1
5	Clear	28							5		0.112	80	55	0.1
6	Cloudy	24				6.79		6	5	0.69	0.125	80	55	0.1
7	Snow	28							5		0.125	80	55	0.1
8	Cloudy	26				6.75		5	5	0.17	0.15	80	55	0.1
9											0.162			
10											0.159			
11	PrtCldy	36				6.95		6	5	0.3	[redacted]	80	55	0.1
12	Cloudy	30							5		[redacted]	80	55	0.1
13	PrtCldy	36				6.92		12	5	0.29	[redacted]	80	55	0.1
14	Rain	36							5		0.148	80	55	0.1
15	Rain	30				6.94		18	5	0.22	[redacted]	80	55	0.1
16											[redacted]			
17											0.095			
18	Cloudy	38				7		19	5	0.29	0.13	80	55	0.1
19	Cloudy	37							5		0.13	80	55	0.1
20	Rain	35				6.98		6	5	0.33	0.13	80	55	0.1
21	Snow	30									0.18	80	55	0.1
22	Snow	34				6.79		6	5	0.3	0.148	80	55	0.1
23											0.184			
24											[redacted]			
25	Cloudy	18				6.77		24	5	0.23	0.174	80	55	0.1
26	Cloudy	12							5		0.176	80	55	0.1
27	Cloudy	18				6.73		5	5	0.3	0.18	80	55	0.1
28	Cloudy	30							5		0.108	80	55	0.1
29	PrtCldy	30				6.77		15	5	0.42	0.108	80	55	0.1
30											0.078			
31											0.092			
	AVG	28.7	ERR	ERR	ERR	6.8342	ERR	11.25	5	0.356667	[redacted]	80	55	0.1
	MAX	38	ERR	ERR	ERR	7	ERR	24	5	0.74	0.307	80	55	0.1
	MIN	12	ERR	ERR	ERR	6.62	ERR	5	5	0.17	0.067	80	55	0.1

Total

City Of Plummer Month of [redacted]
[redacted]

Date	Weather	Temp (F)	Temp. Pond 1	Temp. Pond 2	PH Pond 1	PH Pond 2	DO Pond 1	DO Pond 2	Feed Rate Lbs/day	Residual mg/l	Influent (MGD)	Mix Hrs Pond 1	Mix Hrs Pond 2	Flow (MGD) Effluent
1	Clear	18				6.84		21	5	0.62	0.098	80	55	0.1
2	Snow	30							5		0.188	80	55	0.1
3	PrtCldy	20				6.88		7	5	0.91	0.08	80	55	0.1
4	PrtCldy	25							5		0.249	80	55	0.1
5	Clear	16				6.81		23	5	0.98	0.287	80	55	0.1
6											0.182			
7											0.108			
8	Clear	22				6.98		20	5	0.59	0.266	80	55	0.1
9	Clear	16							5		0.148	80	55	0.1
10											0.128	80	55	0.1
11	Clear	16							5		0.068	80	55	0.1
12	Clear	18				6.81		13	5	1.15	0.081	80	55	0.1
13											0.086			
14											0.14			
15	PrtCldy	20				7.02		20	5	0.21	0.185	80	55	0.1
16	Snow	32							5		0.197	80	55	0.1
17	Cloudy	30				6.86		6	5	1.07	0.267	80	55	0.1
18	Clear	22							5		[redacted]	80	55	0.1
19	Snow	35				6.73		7	5	0.11	0.135	80	55	0.1
20											0.401			
21											0.263			
22	Cloudy	20				6.76		7	5	0.16	0.287	80	55	0.1
23	Cloudy	28							5		0.266	80	55	0.1
24	Rain	34							5		0.286	80	55	0.1
25	Rain	32							10		0.244	80	55	0.1
26	Cloudy	26				6.85		16	10	0.09	0.177	80	55	0.3
27											0.141			

Date	Weather	Temp (F)	Temp. Pond 1	Temp. Pond 2	PH Pond 1	PH Pond 2	DO Pond 1	DO Pond 2	Feed Rate Lbs/day	Residual mg/l	Influent (MGD)	Mix Hrs Pond 1	Mix Hrs Pond 2	Flow (MGD) Effluent
28											0.263			
29														
30														
31														
AVG		24.21053	ERR	ERR	ERR	6.854	ERR	14	5.526316	0.589	[redacted]	80	55	0.11
MAX		35	ERR	ERR	ERR	7.02	ERR	23	10	1.15	0.401	80	55	0.3
MIN		16	ERR	ERR	ERR	6.73	ERR	6	5	0.09	0.068	80	55	0.1

City Of Plummer Month of [redacted] 1999
Mar 1999

Date	Weather	Temp (F)	Temp. Pond 1	Temp. Pond 2	PH Pond 1	PH Pond 2	DO Pond 1	DO Pond 2	Feed Rate Lbs/day	Residual mg/l	Influent (MGD)	Mix Hrs Pond 1	Mix Hrs Pond 2	Flow (MGD) Effluent
1	Snow	28							10		0.277	80	55	0.5
2	Foggy	22							10		0.084	80	55	0.5
3	Cloudy	36				6.68		5	10	0.11	0.104	80	55	0.5
4	Snow	34							10		0.084	80	55	0.1
5	Cloudy	20				6.66		6	10	0.13	0.071	80	55	0.1
6											0.056			
7											[redacted]			
8	Cloudy	15				6.57		9	10	0.17	[redacted]	80	55	0.1
9	Cloudy	20							10		0.161	80	55	0.1
10	Foggy	20				6.53		15	5	0.17	0.141	80	55	0.1
11	Cloudy	18							5		0.04	80	55	0.1
12	PrtCldy	18				6.57		15	5	0.16	0.078	80	55	0.1
13											0.066			
14											0.098			
15	Cloudy	26				6.5		28	5	0.04	0.04	80	55	0.1
16	Cloudy	25							5		0.174	80	55	0.1
17	PrtCldy	23				6.57		20	5	0.06	0.133	80	55	0.1
18	PrtCldy	31							5		0.136	80	55	0.1
19	Clear	40				6.47		17	5	0.06	0.179	80	55	0.1
20											0.1			
21											0.117			
22	Foggy	32				6.65		10	5	0.13	0.152	80	55	0.1
23	Snow	28							5		0.112	80	55	0.1
24	Cloudy	26				6.67		8	5	0.12	0.108	80	55	0.1
25	Rain	34							5		0.135	80	55	0.1
26	Cloudy	30				6.7		10	5	0.15	0.304	80	55	0.1
27											0.261			
28											0.235			
29	Snow	32				6.65		8	5	0.19	0.301	80	55	0.1
30	Snow	28							5		0.274	80	55	0.1
31	Cloudy	20				6.69		9	5	0.1	0.212	80	55	0.1
AVG		26.34783	ERR	ERR	ERR	6.6085	ERR	12.308	6.521739	0.122308	[redacted]	80	55	0.1521739
MAX		40	ERR	ERR	ERR	6.7	ERR	28	10	0.19	0.304	80	55	0.5
MIN		15	ERR	ERR	ERR	6.47	ERR	5	5	0.04	0.04	80	55	0.1

City Of Plummer Month of April
April 1999

Date	Weather	Temp (F)	Temp. Pond 1	Temp. Pond 2	PH Pond 1	PH Pond 2	DO Pond 1	DO Pond 2	Feed Rate Lbs/day	Residual mg/l	Influent (MGD)	Mix Hrs Pond 1	Mix Hrs Pond 2	Flow (MGD) Effluent
1	Clear	18							5		0.115	80	55	0.1
2	Clear	20				6.74		12	5	0.08	0.074	80	55	0.1
3											0.169			
4											0.244			
5	Snow	18				6.68		7		0.14	0.269	80	55	0.1
6	Foggy	16							5		0.193	80	55	0.1
7	Clear	16				7.73		6	5	0.08	0.174	80	55	0.1
8	Rain	30							5		0.274	80	55	0.1
9	PrtCldy	22				6.7		9	5	0.7	0.327	80	55	0.1
10											0.226			
11											0.183			
12	Cloudy	27				6.73		5	5	0.2	0.154	80	55	0.1
13	PrtCldy	32							5		0.143	80	55	0.1
14	Clear	26				6.7		5	10	0.4	0.177	80	55	0.1
15	Clear	45							10		0.124	80	55	0.1
16	Clear	39				6.7		5	10	0.04	0.086	80	55	0.1
17											0.124			

Date	Weather	Temp (F)	Temp. Pond 1	Temp. Pond 2	PH Pond 1	PH Pond 2	DO Pond 1	DO Pond 2	Feed Rate Lbs/day	Residual mg/l	Influent (MGD)	Mix Hrs Pond 1	Mix Hrs Pond 2	Flow (MGD) Effluent
18											0.125			
19	Cloudy	42				6.93		4	10	0.01	0.119	80	55	0.1
20	Cloudy	37							10		0.126	80	55	0.1
21	Clear	32				6.94		3	10	0.04	0.12	80	55	0.1
22	Rain	32							10		0.117	80	55	0.1
23	Clear	30				6.97		5	10	0.04	0.125	80	55	0.1
24											0.114			
25											0.108			
26	Clear	33				6.83		5	10	0.04	0.135	80	55	0.1
27	Clear	28							10		0.122	80	55	0.1
28	Clear	32				7.25		4	10	0.04	0.12	80	55	0.1
29	PrtCldy								10		0.122	80	55	0.1
30	PrtCldy	34				7.31		7	10	0.05	0.113	80	55	0.1
31														
	AVG	29	ERR	ERR	ERR	6.9392	ERR	5.9231	8.095238	0.143077	0.154067	80	55	0.1
	MAX	45	ERR	ERR	ERR	7.73	ERR	12	10	0.7	0.327	80	55	0.1
	MIN	16	ERR	ERR	ERR	6.68	ERR	3	5	0.01	0.074	80	55	0.1

City Of Plummer Month of May
May 1999

Date	Weather	Temp (F)	Temp. Pond 1	Temp. Pond 2	PH Pond 1	PH Pond 2	DO Pond 1	DO Pond 2	Feed Rate Lbs/day	Residual mg/l	Influent (MGD)	Mix Hrs Pond 1	Mix Hrs Pond 2	Flow (MGD) Effluent
1											0.109			
2											0.114			
3	Rain	34							10	0.05	0.21	80	55	
4	Snow	25							10		0.32	80	55	
5	Clear	24									0.225	80	55	
6	Cloudy	20									0.16	80	55	
7	Cloudy	32									0.144	80	55	
8											0.201			
9											0.134			
10	Clear	18									0.129	80	55	
11	Foggy	20									0.122	80	55	
12	Cloudy	36									0.12	80	55	
13	PrtCldy	32									0.124	80	55	
14	Clear	34									0.112	80	55	
15											0.109			
16											0.105			
17	PrtCldy	45									0.102	80	55	
18	PrtCldy	40									0.099	80	55	
19	Sunny	38									0.106	80	55	
20	PrtCldy	32									0.102	80	55	
21	Clear	32									0.114	80	55	
22											0.11			
23											0.102			
24	Clear	40									0.101	80	55	
25	Clear	50									0.101	80	55	
26	Clear	37									0.095	80	55	
27	Clear	36									0.095	80	55	
28	Clear	40									0.092	80	55	
29											0.081			
30											0.066			
31											0.066			
	AVG	33.25	ERR	ERR	ERR	0	ERR	0	6.666667	0.025	0.124839	80	55	ERR
	MAX	50	ERR	ERR	ERR	0	ERR	0	10	0.05	0.32	80	55	ERR
	MIN	18	ERR	ERR	ERR	0	ERR	0	0	0	0.066	80	55	ERR

City Of Plummer Month of June
June 1999

Date	Weather	Temp (F)	Temp. Pond 1	Temp. Pond 2	PH Pond 1	PH Pond 2	DO Pond 1	DO Pond 2	Feed Rate Lbs/day	Residual mg/l	Influent (MGD)	Mix Hrs Pond 1	Mix Hrs Pond 2	Flow (MGD) Effluent
1	Clear	40							20	0.22	0.082	80	55	
2	Rain	40							20		0.077	80	55	
3	Clear	40							20		0.106	80	55	
4	Clear	42							20	0.22	0.114	80	55	0.314
5									20		0.091			
6									20		0.084			
7	Clear	32							20		0.081	80	55	

8	PrtCldy	38							20		0.076	80	55	
9	PrtCldy	38							20		0.074	80	55	
10	PrtCldy	38							20	0.091	0.071	80	55	0.314
11	Clear								20		0.076	80	55	
12									20		0.076			
13									20		0.066			
14	Clear	51							20		0.067	80	55	
15	Clear	54							20	0.37	0.069	80	55	0.314
16	Clear	54							20		0.074	80	55	0.314
17									20		0.076			
18	**Rain**	**54**							20		0.076	80	55	0.314
19									20		0.073			
20									20		0.073			
21	Rain	48							20		0.075	80	55	
22	Cloudy	40							20		0.075	80	55	
23	Cloudy	48							20	0.1	0.071	80	55	0.314
24	Cloudy	42							20		0.067	80	55	
25	Rain	40							20		0.08	80	55	
26									20		0.117			
27									20		0.043			
28	Clear	34							20	0.06	0.057	80	55	0.314
29	PrtCldy	44							20		0.092	80	55	0.1345
30	Clear	48							20		0.092	80	55	0.1345
31														
	AVG	43.25	ERR	ERR	ERR	ERR	ERR	ERR	20	0.151571	**0.078367**	80	55	0.2741111
	MAX	54	ERR	ERR	ERR	ERR	ERR	ERR	20	0.37	0.117	80	55	0.314
	MIN	32	ERR	ERR	ERR	ERR	ERR	ERR	20	0	0.043	80	55	0.1345

City Of Plummer Month of July

July 1999

Date	Weather	Temp (F)	Temp. Pond 1	Temp. Pond 2	PH Pond 1	PH Pond 2	DO Pond 1	DO Pond 2	Feed Rate Lbs/day	Residual mg/l	Influent (MGD)	Mix Hrs Pond 1	Mix Hrs Pond 2	Flow (MGD) Effluent
1	Clear	48							10		0.111	80	55	
2	Clear	40							10	0.14	0.115	80	55	0.1545
3									10		0.095	80	55	
4									10		0.097	80	55	
5									10		0.107	80	55	
6	Clear	45							10	0.99	0.115	80	55	0.1845
7	Clear	50							10	0.5	0.097	80	55	0.1845
8	Clear	44							10	0.48	0.112	80	55	0.1845
9	Clear	40							10	0.42	0.088	80	55	0.1845
10									10		0.079			
11									10		0.072			
12	Clear	55							10	0.45	0.073	80	55	0.314
13	Clear	55							10	0.37	0.072	80	55	0.314
14	Clear	54							10	0.32	0.076	80	55	0.314
15	Clear	48							10		0.077	80	55	
16	Clear	48							10		0.072	80	55	
17									10		0.073			
18									10		**0.067**			
19	Foggy	40							10	0.28	0.069	80	55	0.314
20	Clear	45							10	0.19	0.073	80	55	0.314
21	Clear	50							10		0.075	80	55	
22	Clear	46							10		0.069	80	55	
23	Clear	48							10	0.36	0.073	80	55	0.314
24									10		0.068			
25									10		0.063			
26	Clear	44							10	0.24	0.07	80	55	0.314
27	Clear	46							10		0.071	80	55	
28	Clear	54							10		0.07	80	55	0.314
29	Clear	56							10	0.03	0.069	80	55	0.314
30	Clear	50							10		0.066	80	55	
31											0.076			
	AVG	47.90476	ERR	ERR	ERR	ERR	ERR	ERR	10	0.366923	0.080968	80	55	0.2656071
	MAX	56	ERR	ERR	ERR	ERR	ERR	ERR	10	0.99	0.115	80	55	0.314
	MIN	40	ERR	ERR	ERR	ERR	ERR	ERR	10	0.03	0.063	80	55	0.1545

City Of Plummer Month of August

Aug 1999

Date	Weather	Temp (F)	Temp. Pond 1	Temp. Pond 2	PH Pond 1	PH Pond 2	DO Pond 1	DO Pond 2	Feed Rate Lbs/day	Residual mg/l	Influent (MGD)	Mix Hrs Pond 1	Mix Hrs Pond 2	Flow (MGD) Effluent
1											0.062			
2	PrtCldy	54							10	0.28	0.068	80	55	0.314
3	PrtCldy	56							10		0.067	80	55	
4	PrtCldy	62							10	0.23	0.061	80	55	0.314
5	Clear	54							10	0.23	0.073	80	55	0.314
6	Clear	54							10		0.079	80	55	
7									10		0.093			
8									10		0.117			
9	Foggy	46							10		0.092	80	55	
10	Clear	44							10	0.24	0.075	80	55	0.314
11	Clear	56							10		0.075	80	55	
12	Clear	46							10	0.28	0.074	80	55	0.314
13	PrtCldy	44							10	0.45	0.073	80	55	0.314
14											0.077			
15											0.071			
16	Clear	42							10	0.45	0.077	80	55	0.314
17	Clear	38							10		0.08	80	55	0
18	Clear	46							10	0.14	0.071	80	55	0.314
19	Clear	56							10		0.068	80	55	
20	Clear	48							10	0.34	0.063	80	55	0.314
21											0.063			
22											0.062			
23	Clear	40							10	0.44	0.059	80	55	0.314
24	Clear	52							10		0.063	80	55	
25	PrtCldy	56							10	0.44	0.064	80	55	0.314
26	Clear	42							10		0.06	80	55	
27	Clear	44							10	0.02	0.067	80	55	
28											0.06			
29											0.061			
30	Clear	50								0.57	0.051	80	55	0.314
31	Clear	46									0.055	80	55	
	AVG	48.90909	ERR	ERR	ERR	ERR	ERR	ERR	10	0.316154	0.070355	80	55	0.2898462
	MAX	62	ERR	ERR	ERR	ERR	ERR	ERR	10	0.57	0.117	80	55	0.314
	MIN	38	ERR	ERR	ERR	ERR	ERR	ERR	10	0.02	0.051	80	55	0

City Of Plummer Month of Sept.

Sept 1999

Date	Weather	Temp (F)	Temp. Pond 1	Temp. Pond 2	PH Pond 1	PH Pond 2	DO Pond 1	DO Pond 2	Feed Rate Lbs/day	Residual mg/l	Influent (MGD)	Mix Hrs Pond 1	Mix Hrs Pond 2	Flow (MGD) Effluent
1	Foggy	32							10	0.056	0.056	80	55	0.314
2	Foggy	35							10		0.073	80	55	
3	Foggy	42							10	0.055	0.059	80	55	0.314
4											0.058			
5											0.054			
6											0.059			
7	Clear	32									0.056	80	55	
8	Clear	25									0.061	80	55	
9	Clear	32									0.069	80	55	
10	Clear	44									0.074	80	55	
11											0.068			
12											0.058			
13	Clear	35									0.067	80	55	
14	Clear	30									0.065	80	55	
15											0.066			
16											0.064			
17											0.068			
18											0.065			
19											0.065			
20	Clear	36									0.077	80	55	
21	Clear	38									0.07	80	55	
22	Clear	38									0.068	80	55	
23	Clear	40									0.069	80	55	
24	PrtCldy	44									0.058	80	55	
25											0.062			
26											0.067			
27	Foggy	26									0.07	80	55	
28	Clear	20									0.073	80	55	
29	Cloudy	30									0.063	80	55	

Date	Weather	Temp (F)	Temp. Pond 1	Temp. Pond 2	PH Pond 1	PH Pond 2	DO Pond 1	DO Pond 2	Feed Rate Lbs/day	Residual mg/l	Influent (MGD)	Mix Hrs Pond 1	Mix Hrs Pond 2	Flow (MGD) Effluent
30	Clear	28									0.065	80	55	
31														
	AVG	33.72222	ERR	ERR	ERR	ERR	ERR	ERR	10	0.0555	0.0649	80	55	0.314
	MAX	44	ERR	ERR	ERR	ERR	ERR	ERR	10	0.056	0.077	80	55	0.314
	MIN	20	ERR	ERR	ERR	ERR	ERR	ERR	10	0.055	0.054	80	55	0.314

City Of Plummer Month of October

Oct 1999

Date	Weather	Temp (F)	Temp. Pond 1	Temp. Pond 2	PH Pond 1	PH Pond 2	DO Pond 1	DO Pond 2	Feed Rate Lbs/day	Residual mg/l	Influent (MGD)	Mix Hrs Pond 1	Mix Hrs Pond 2	Flow (MGD) Effluent
1	Clear	25									0.062	80	55	
2	Clear										0.061	80	55	
3											0.062	80	55	
4	Clear	25									0.066	80	55	
5	Cloudy	30							10		0.066	80	55	
6	Cloudy	35									0.065	80	55	
7	Cloudy	35								0.41	0.067	80	55	0.314
8	Cloudy	40							10	0.4	0.097	80	55	0.314
9											0.137			
10											0.088			
11	Cloudy	35								0.19	0.079	80	55	0.314
12	Cloudy	40							10		0.079	80	55	
13	Cloudy	45							10	0.14	0.074	80	55	0.314
14	Cloudy	35							15		0.076	80	55	
15	Clear	35									0.079	80	55	
16											0.08			
17											0.08			
18	Clear	30							15		0.085	80	55	
19	Clear	30							15	0.73	0.074	80	55	0.314
20	Clear	30							10		0.061	80	55	
21	Clear	30							10	0.23	0.063	80	55	0.314
22	Clear	30									0.061	80	55	
23														
24														
25	PrtCldy	32							15		0.088	80	55	
26		42							15		0.077	80	55	
27		30							15	0.74	0.07	80	55	0.314
28	Rain	42									0.0144	80	55	0.1
29	Cloudy	32									0.0158			
30											0.076			
31											0.076			
	AVG	33.71429	ERR	ERR	ERR	ERR	ERR	ERR	11.53846	0.355	0.071697	80	55	0.28725
	MAX	45	ERR	ERR	ERR	ERR	ERR	ERR	15	0.74	0.137	80	55	0.314
	MIN	25	ERR	ERR	ERR	ERR	ERR	ERR	0	0	0.0144	80	55	0.1

City Of Plummer Month of Nov.

Nov 1999

Date	Weather	Temp (F)	Temp. Pond 1	Temp. Pond 2	PH Pond 1	PH Pond 2	DO Pond 1	DO Pond 2	Feed Rate Lbs/day	Residual mg/l	Influent (MGD)	Mix Hrs Pond 1	Mix Hrs Pond 2	Flow (MGD) Effluent
1	Foggy	18									0.096	80	55	
2	Clear	28									0.072	80	55	
3	Clear	22									0.069	80	55	
4	Cloudy	33									0.071	80	55	
5	Cloudy	24									0.074	80	55	
6											0.087			
7											0.182			
8	Cloudy	34									0.081	80	55	
9	Foggy	38									0.083	80	55	
10	Rain	42									0.085	80	55	
11	Cloudy	42									0.086	80	55	
12	Cloudy	57									0.092	80	55	
13											0.136			
14											0.13			
15	Cloudy	28									0.092	80	55	
16	Cloudy	27									0.082	80	55	
17	Rain	38									0.083	80	55	
18	Clear	30									0.173	80	55	
19	Cloudy	34									0.11	80	55	

Date	Weather	Temp (F)	Temp. Pond 1	Temp. Pond 2	PH Pond 1	PH Pond 2	DO Pond 1	DO Pond 2	Feed Rate Lbs/day	Residual mg/l	Influent (MGD)	Mix Hrs Pond 1	Mix Hrs Pond 2	Flow (MGD) Effluent
20-											0.102			
21											0.092			
22	Clear	25									0.06	80	55	
23	Cloudy	33									0.1	80	55	
24	Clear	35									0.113	80	55	
25											0.191			
26											0.247			
27											0.274			
28											0.171			
29	Clear	33									0.129	80	55	
30	Rain	38									0.088	80	55	
31														
	AVG	32.95	ERR	ERR	ERR	ERR	ERR	ERR	ERR	ERR	0.115033	80	55	ERR
	MAX	57	ERR	ERR	ERR	ERR	ERR	ERR	ERR	ERR	0.274	80	55	ERR
	MIN	18	ERR	ERR	ERR	ERR	ERR	ERR	ERR	ERR	0.06	80	55	ERR

City Of Plummer Month of Dec.

Dec 1999

Date	Weather	Temp (F)	Temp. Pond 1	Temp. Pond 2	PH Pond 1	PH Pond 2	DO Pond 1	DO Pond 2	Feed Rate Lbs/day	Residual mg/l	Influent (MGD)	Mix Hrs Pond 1	Mix Hrs Pond 2	Flow (MGD) Effluent
1	Snow	32							10		0.208	80	55	0
2	Rain	34							10		0.268	80	55	0.1
3	Clear	20				7.51		6	10	0.43	0.195	80	55	0
4											0.36			
5											0.232			
6	Snow	33				7.51		4	5	0.21	0.24	80	55	0.1
7	Cloudy	33							5		0.298	80	55	0.1
8	Cloudy	32				7.4		6	5	0.14	0.295	80	55	0.1
9	Snow	32							5		0.109	80	55	0.1
10	Cloudy	34				7.36		5	5	0.06	0.133	80	55	0.1
11											0.168			
12											0.126			
13	Clear	25				7.42		6	5	0.09	0.123	80	55	0.1
14	Snow	32							5		0.323	80	55	0.1
15	Rain	38							5		0.265	80	55	0.1
16	Cloudy	42							5		0.244	80	55	0.1
17	Foggy	28				7.36		6	5	0.11	0.18	80	55	0.1
18											0.276			
19											0.325			
20	PrtCldy	25				7.21		6	5	0.04	0.279	80	55	0.1
21	Cloudy	28							5		0.233	80	55	0.1
22	Cloudy	28				7.21		6	5	0.01	0.208	80	55	0.1
23											0.229			
24											0.22			
25											0.214			
26											0.22	80	55	0.1
27	Clear	28				7.16		5	5	0.01	0.22	80	55	0.1
28	Clear	25				7.1		6	5	0.02	0.156	28		
29											0.115			
30											0.112			
31														
	AVG	30.5	ERR	ERR	ERR	7.324	ERR	5.6	5.833333	0.112	0.219133	77.26316	55	0.0888889
	MAX	42	ERR	ERR	ERR	7.51	ERR	6	10	0.43	0.36	80	55	0.1
	MIN	20	ERR	ERR	ERR	7.1	ERR	4	5	0.01	0.109	28	55	0
	AVG	30.86111	ERR	ERR	ERR	7.3053	ERR	5.4667	ERR		0.122205			
	MAX	42	ERR	ERR	ERR	7.51	ERR	6	ERR		0.401			
	MIN	20	ERR	ERR	ERR	7.1	ERR	4	ERR		0.0144			

City Of Plummer Month of Jan 2000

Date	Weather	Temp (F)	PH Pond 1	PH Pond 2	DO Pond 1	DO Pond 2	Feed Rate Lbs/day	Residual mg/l	Influent (MGD)	Mix Hrs Pond 2	Mix Hrs Pond 2	Flow (MGD) Effluent
1									0.102			
2									0.118			
3	Cloudy	20		7.04		6	5	0.02	0.122	80	55	0.1
4	Snow	30					5		0.11	80	55	0.1
5	Cloudy	25		7.06		10	5	0.11	0.231	80	55	0.1
6	Clear	20							0.262	80	55	0.1
7	Cloudy	30		6.7		8	5	0.12	0.2	80	55	0.1
8									0.2			
9									0.245			
10									0.297			
11	Cloudy	32				9	5	0.12	0.253	80	55	0.1
12	Clear	28				14	5	0.22	0.227	80	55	0.1
13									0.202			
14	Clear	36		6.92		8	5	0.06	0.135	80	55	0.1
15									0.24			
16									0.15			
17	Clear	20		7		7	5	0.13	0.115	80	55	0.1
18	Cloudy	18					5		0.266	80	55	0.1
19	Snow	25		6.92		12	5	0.13	0.306	80	55	0.1
20	Snow	28					5		0.257	80	55	0.1
21	Snow	28		6.9		4	5	0.03	0.257	80	55	0.1
22									0.21			
23									0.199			
24	Cloudy	28		6.85		10	5	0.14	0.191	80	55	0.1
25	Snow	30					5		0.189	80	55	0.1
26	Snow	26		6.84		16	5	0.01	0.188	80	55	0.1
27	Snow	25					5		0.187	80	55	0.1
28	Foggy	20		6.83		6	5	0.03	0.183	80	55	0.1
29									0.179			
30									0.178			
31	Snow	18		6.92	4	4	5	0.16	0.178	80	55	0.1
	AVG	25.6316	ERR	6.90727	4	8.76923	5	0.098462	0.199258	80	55	0.1
	MAX	36	ERR	7.06	4	16	5	0.22	0.306	80	55	0.1
	MIN	18	ERR	6.7	4	4	5	0.01	0.102	80	55	0.1

City Of Plummer Month of Feb 2000

Date	Weather	Temp (F)	PH Pond 1	PH Pond 2	DO Pond 1	DO Pond 2	Feed Rate Lbs/day	Residual mg/l	Influent (MGD)	Mix Hrs Pond 1	Mix Hrs Pond 2	Flow (MGD) Effluent
1	Rain	34					5		0.186	80	55	0.1
2	Rain	37					5		0.232	80	55	0.1
3	Clear	15					5		0.273	80	55	0.1
4	Clear	18		6.98		12	5	0.08	0.234	80	55	0.1
5									0.097			
6									0.252			
7	Foggy	34		6.75		10	5	0.06	0.204	80	55	0.1
8	Clear	35					5		0.212	80	55	0.1
9	Clear	33		6.82		14	5	0.14	0.141	80	55	0.1
10	Foggy	18					5		0.165	80	55	0.1
11	Cloudy	25		6.76		17	5	0.11	0.045	80	55	0.1
12									0.045			
13									0.076			
14	Snow	33		6.89		9	5	0.13	0.071	80	55	0.1
15	Snow	32					5		0.045	80	55	0.1
16	Foggy	26		6.88		16	5	0.12	0.204	80	55	0.1
17	Foggy	16					5		0.114	80	55	0.1
18	Cloudy	10		6.93		16	5	0.08	0.05	80	55	0.1
19									0.053			
20									0.151			
21									0.195			
22	Foggy	39		6.77		20	5	0.12	0.197	80	55	0.1
23	Snow	34					5		0.245	80	55	0.1
24	Clear	30		6.73		5	5	0.04	0.295	80	55	0.1
25	Foggy	20					5		0.145	80	55	0.1
26									0.116			
27									0.098			
28	Rain	36					5		0.119	80	55	0.1

29	Cloudy	34		6.73		11	5	0.06	0.154	80	55	0.1
30												
31												
	AVG	27.95	ERR	6.824	ERR	13	5	0.085455	0.152207	80	55	0.1
	MAX	39	ERR	6.98	ERR	20	5	0.14	0.295	80	55	0.1
	MIN	10	ERR	6.73	ERR	5	5	0	0.045	80	55	0.1

City Of Plummer Month of March 2000

Date	Weather	Temp (F)	PH Pond 1	PH Pond 2	DO Pond 1	DO Pond 2	Feed Rate Lbs/day	Residual mg/l	Influent (MGD)	Mix Hrs Pond 1	Mix Hrs Pond 2	Flow (MGD) Effluent
1	PrtCldy	30					5		0.143	80	55	0.1
2	Clear	34		6.7		10	5	0.08	0.1	80	55	0.1
3	Clear	40					5		0.081	80	55	0.1
4									0.079			
5									0.204			
6	Cloudy	34		6.75		9	5	0.14	0.238	80	55	0.1
7	Cloudy	34					5		0.218	80	55	0.1
8	Rain	32		6.6		5	5	0.11	0.113	80	55	0.1
9	Foggy	33					5		0.07	80	55	0.1
10	Clear	35		6.74		9	5	0.13	0.05	80	55	0.1
11									0.065			
12									0.145			
13	Cloudy	25		6.75		10	5	0.03	0.065	80	55	0.1
14	PrtCldy	38					5		0.053	80	55	0.1
15	Clear	23		6.69		5	5	0.05	0.259	80	55	0.1
16	Cloudy	35					5		0.239	80	55	0.1
17	Clear	23		6.73		6	5	0.03	0.149	80	55	0.1
18									0.169			
19									0.169			
20	Foggy	20		6.7		10	5	0.07	0.127	80	55	0.1
21	Cloudy	28					5		0.074	80	55	0.1
22	Snow	30		6.71		11	5	0.08	0.05	80	55	0.1
23	Cloudy	32					5		0.061	80	55	0.1
24	Clear	27		6.74		12	5	0.08	0.147	80	55	0.1
25									0.189			
26									0.129			
27	Cloudy	28		6.78		5	5	0.04	0.098	80	55	0.1
28	Snow	32					5		0.098	80	55	0.1
29	Cloudy	28		6.69		10	5	0.07	0.077	80	55	0.1
30	PrtCldy	23					5		0.043	80	55	0.1
31	Clear	28		6.71		9	5	0.03	0.127	80	55	0.1
	AVG	30.087	ERR	6.71462	ERR	8.53846	5	0.072308	0.123516	80	55	0.1
	MAX	40	ERR	6.78	ERR	12	5	0.14	0.259	80	55	0.1
	MIN	20	ERR	6.6	ERR	5	5	0.03	0.043	80	55	0.1

City Of Plummer Month of April 2000

Date	Weather	Temp (F)	PH Pond 1	PH Pond 2	DO Pond 1	DO Pond 2	Feed Rate Lbs/day	Residual mg/l	Influent (MGD)	Mix Hrs Pond 1	Mix Hrs Pond 2	Flow (MGD) Effluent
1									0.059			
2									0.03			
3	Clear	30		6.71		10	5	11	0.035	80	55	0.1
4	PrtCldy	43					5		0.116	80	55	0.1
5	Clear	27		6.72		7	5	0.11	0.083	80	55	0.1
6	Snow	32					5		0.069	80	55	0.1
7	Clear	25		6.7		6	5	0.11	0.08	80	55	0.1
8									0.058			
9									0.048			
10	Clear	27		6.74		8	5	0.01	0.055	80	55	0.1
11	PrtCldy	25					5		0.09	80	55	0.1
12	PrtCldy	40		6.72		5	5	0.1	0.09	80	55	0.1
13	Rain	43					5		0.038	80	55	0.1
14	Rain	38					5		0.098	80	55	0.1
15									0.151			
16									0.152			
17	Foggy	40		6.71		10	5	0.3	0.311	80	55	0.1
18	Sunny	40					5		0.144	80	55	0.1
19	PrtCldy	42		6.73		9	5	0.3	0.088	80	55	0.1

Date	Weather	Temp (F)	PH Pond 1	PH Pond 2	DO Pond 1	DO Pond 2	Feed Rate Lbs/day	Residual mg/l	Influent (MGD)	Mix Hrs Pond 1	Mix Hrs Pond 2	Flow (MGD) Effluent
20	Clear	34					5		0.054	80	55	0.1
21	Foggy	36		6.74		6	5	0.3	0.044	80	55	0.1
22									0.069			
23									0.061			
24	Clear	27		6.7		6	5	0.8	0.147	80	55	0.1
25	Cloudy	35					5		0.121	80	55	0.1
26	Foggy	30		6.73		5	5	0.1	0.054	80	55	0.1
27	Clear	36				5	5		0.074	80	55	0.1
28	Rain	30		6.73		8	5	0.1	0.092	80	55	0.1
29									0.122			
30									0.123			
31												
	AVG	34	ERR	6.72091	ERR	7.08333	5	1.202727	0.091867	80	55	0.1
	MAX	43	ERR	6.74	ERR	10	5	11	0.311	80	55	0.1
	MIN	25	ERR	6.7	ERR	5	5	0.01	0.03	80	55	0.1

City Of Plummer Month of May 2000

Date	Weather	Temp (F)	PH Pond 1	PH Pond 2	DO Pond 1	DO Pond 2	Feed Rate Lbs/day	Residual mg/l	Influent (MGD)	Mix Hrs Pond 1	Mix Hrs Pond 2	Flow (MGD) Effluent
1	PrtCldy	45		6.74			5	0.03	0.134	80	55	0.1
2	Rain	48					5		0.049	80	55	0.1
3	Rain	50					5		0.209	80	55	
4	Rain	38					5		0.076	80	55	
5	Foggy	40					5		0.035	80	55	
6									0.121			
7									0.125			
8	Clear	34					5		0.127	80	55	
9	Rain	42					5		0.121	80	55	
10	PrtCldy	37					5.		0.19	80	55	
11	Snow	32					5		0.127	80	55	
12	Cloudy	36					5		0.133	80	55	
13									0.075			
14									0.02			
15	Clear	46					5		0.106	80	55	0.1
16	Clear	48		6.65		0.7	5	0.01	0.084	80	55	0.1
17	Cloudy	45					5		0.139	80	55	0.1
18	Clear	48					5		0.136	80	55	0.1
19	Rain	45		6.69		1	5		0.151	80	55	0.1
20									0.152	80	55	0.1
21									0.141	80	55	0.1
22	Clear	50					5		0.145	80	55	0.1
23	PrtCldy	48		6.74		0.9	5		0.143	80	55	0.1
24	Clear	50					5		0.132	80	55	0.1
25	PrtCldy	45		6.77			5		0.131	80	55	0.1
26	PrtCldy	45		6.79		1.3	5	0.08	0.127	80	55	0.1
27									0.13			
28									0.137			
29									0.158			
30	Foggy	46		6.7		0.5	5	0.08	0.142	80	55	0.1
31									0.13			
	AVG	43.7143	ERR	6.72571	ERR	0.88	5	0.05	0.123419	80	55	0.1
	MAX	50	ERR	6.79	ERR	1.3	5	0.08	0.209	80	55	0.1
	MIN	32	ERR	6.65	ERR	0.5	5	0.01	0.02	80	55	0.1

City Of Plummer Month of June 2000

Date	Weather	Temp (F)	PH Pond 1	PH Pond 2	DO Pond 1	DO Pond 2	Feed Rate Lbs/day	Residual mg/l	Influent (MGD)	Mix Hrs Pond 1	Mix Hrs Pond 2	Flow (MGD) Effluent
1	PrtCldy	40							0.219	80	55	
2	Clear	50							0.081	80	55	
3									0.078			
4									0.067			
5	Cloudy	55							0.092	80	55	
6	Cloudy	50							0.106	80	55	
7	PrtCldy	58							0.065	80	55	
8	Cloudy	52							0.099	80	55	
9	Cloudy	45							0.111	80	55	
10									0.108			

11 .									0.107			
12	Rain	48							0.077	80	55	
13	Cloudy	46							0.101	80	55	
14	Rain	55							0.17	80	55	
15	Clear	52							0.042	80	55	
16	Clear	48							0.096	80	55	
17									0.115			
18									0.107			
19	Cloudy	48							0.097	80	55	
20	Clear	47							0.047	80	55	
21	Clear	55							0.047	80	55	
22	Clear	58							0.066	80	55	
23	Cloudy	48							0.064	80	55	
24									0.082			
25									0.086			
26	Clear	58					25		0.09	80	55	
27	Clear	58					25	1.16	0.091	80	55	0.315
28	Clear	60					25	1.35	0.108	80	55	0.315
29	Clear	60					25	1.05	0.086	80	55	0.315
30	PrtCldy	58							0.051	80	55	0.315
31												
	AVG	52.2273	ERR	ERR	ERR	ERR	25	1.186667	0.091867	80	55	0.315
	MAX	60	ERR	ERR	ERR	ERR	25	1.35	0.219	80	55	0.315
	MIN	40	ERR	ERR	ERR	ERR	25	1.05	0.042	80	55	

City Of Plummer Month of July 2000

Date	Weather	Temp (F)	PH Pond 1	PH Pond 2	DO Pond 1	DO Pond 2	Feed Rate Lbs/day	Residual mg/l	Influent (MGD)	Mix Hrs Pond 1	Mix Hrs Pond 2	Flow (MGD) Effluent
1									0.046			
2									0.049			
3	Cloudy	48					25	1.54	0.04	80	55	0.315
4							25		0.067	80	55	
5	Foggy	48					25	0.15	0.078	80	55	0.315
6	Cloudy	56					25		0.086	80	55	
7	Cloudy	58					25	1.26	0.064	80	55	0.315
8							25		0.059			
9							25		0.051			
10	Clear	50					25	1.75	0.056	80	55	0.315
11	Clear	56					25		0.06	80	55	
12	Clear	60					25	1.7	0.056	80	55	0.315
13	Clear	60					25		0.059	80	55	
14	Clear	61					25		0.055	80	55	0.315
15							25		0.055			
16							25		0.059			
17	Clear	60					25	1.1	0.048	80	55	0.315
18	Cloudy	62					25		0.06	80	55	
19	Clear	60					25	0.78	0.06	80	55	0.315
20	Clear	58					25	0.39	0.058	80	55	
21	Clear	50					25		0.06	80	55	0.315
22									0.057			
23									0.049			
24	Clear	48					25	0.75	0.053	80	55	0.315
25	Clear	50					25		0.055	80	55	
26	Clear	55					25		0.055	80	55	0.315
27	Clear	60					25	0.81	0.062	80	55	
28	Clear	50						0.87	0.061	80	55	0.315
29									0.066			
30									0.072			
31	Clear	60						0.26	0.075	80	55	0.315
	AVG	55.5	ERR	ERR	ERR	ERR	25	0.946667	0.0595	80	55	0.315
	MAX	62	ERR	ERR	ERR	ERR	25	1.75	0.086	80	55	0.315
	MIN	48	ERR	ERR	ERR	ERR	25	0.15	0.04	80	55	

City Of Plummer Month of Aug 2000

Date	Weather	Temp (F)	PH Pond 1	PH Pond 2	DO Pond 1	DO Pond 2	Feed Rate Lbs/day	Residual mg/l	Influent (MGD)	Mix Hrs Pond 1	Mix Hrs Pond 2	Flow (MGD) Effluent
1	Clear	65					20		0.079	80	55	

2	Clear	56					20	0.76	0.056	80	55	0.315
3	Clear	56					20		0.055	80	55	
4	Clear	55					20	0.88	0.053	80	55	0.315
5									0.055			
6									0.062			
7	Clear	58					20	0.86	0.073	80	55	0.315
8	Clear	50					20		0.053	80	55	
9	Clear	50					20	0.53	0.049	80	55	0.315
10	Clear	62					20		0.047	80	55	
11	PrtCldy	82					20	0.53	0.049	80	55	0.315
12									0.047			
13									0.049			
14	Clear	50					20	0.26	0.05	80	55	0.315
15	PrtCldy	45					20		0.057	80	55	
16	Clear	58					20	0.86	0.052	80	55	0.315
17	Clear	40					20		0.048	80	55	
18	Clear	60					20	0.71	0.046	80	55	0.315
19									0.05			
20									0.045			
21	Clear	36					20	0.39	0.048	80	55	0.315
22	Clear	34					20		0.049	80	55	
23	Clear	40					20	0.73	0.055	80	55	0.315
24	Cloudy	68					20		0.066	80	55	
25	Cloudy	55					20	0.61	0.059	80	55	0.315
26									0.07			
27									0.097			
28	Clear	32					20	0.8	0.111	80	55	0.315
29	Clear	38					20		0.069	80	55	
30	Cloudy	52					20	1.32	0.056	80	55	0.315
31	Clear	36					20		0.059	80	55	
	AVG	51.2174	ERR	ERR	ERR	ERR	20	0.710769	0.058516	80	55	0.315
	MAX	82	ERR	ERR	ERR	ERR	20	1.32	0.111	80	55	0.315
	MIN	32	ERR	ERR	ERR	ERR	20	0.26	0.045	80	55	

City Of Plummer Month of Sept 2000

Date	Weather	Temp (F)	PH Pond 1	PH Pond 2	DO Pond 1	DO Pond 2	Feed Rate Lbs/day	Residual mg/l	Influent (MGD)	Mix Hrs Pond 1	Mix Hrs Pond 2	Flow (MGD) Effluent
1	Cloudy	48					20	0.76	0.077	80	55	0.315
2									0.054			
3									0.053			
4									0.05			
5	Cloudy	47					20		0.055	80	55	
6	Cloudy	52					20	2.2	0.051	80	55	0.315
7	Foggy	47					20		0.052	80	55	
8	Cloudy	52					20	1.1	0.055	80	55	0.315
9									0.049			
10									0.05			
11	Cloudy	52							0.075	80	55	
12	Foggy	48							0.075	80	55	
13	Foggy	50							0.058	80	55	
14	PrtCldy	52							0.05	80	55	
15	Clear	54							0.052	80	55	
16									0.048			
17									0.046			
18	Cloudy	58							0.05	80	55	
19	PrtCldy	52							0.049	80	55	
20	PrtCldy	35							0.05	80	55	
21	Rain	45							0.053	80	55	
22	Clear	30							0.048	80	55	
23									0.046			
24									0.048			
25	Clear	30							0.053	80	55	
26	Clear	30							0.056	80	55	
27	Clear	34							0.051	80	55	
28	Clear	36							0.052	80	55	
29									0.053			
30												
31												
	AVG	44.8421	ERR	ERR	ERR	ERR	20	1.353333	0.053759	80	55	0.315
	MAX	58	ERR	ERR	ERR	ERR	20	2.2	0.077	80	55	0.315

Date	Weather	Temp (F)	PH Pond 1	PH Pond 2	DO Pond 1	DO Pond 2	Feed Rate Lbs/day	Residual mg/l	Influent (MGD)	Mix Hrs Pond 1	Mix Hrs Pond 2	Flow (MGD) Effluent
MIN		30	ERR	ERR	ERR	ERR	20	0.76	0.046	80	55	0.315

City Of Plummer Month of Oct 2000

Date	Weather	Temp (F)	PH Pond 1	PH Pond 2	DO Pond 1	DO Pond 2	Feed Rate Lbs/day	Residual mg/l	Influent (MGD)	Mix Hrs Pond 1	Mix Hrs Pond 2	Flow (MGD) Effluent
1									0.119			
2	PrtCldy	46							0.08	80	55	
3	Foggy	35							0.058	80	55	
4	Foggy	32							0.057	80	55	
5	Foggy	32							0.048	80	55	
6	Clear	32							0.051	80	55	
7									0.049			
8									0.047			
9	Clear	35							0.053	80	55	
10	PrtCldy	40							0.052	80	55	
11	PrtCldy	43							0.052	80	55	
12	PrtCldy	45							0.05	80	55	
13	Rain	42							0.048	80	55	
14									0.057	80	55	
15									0.048	80	55	
16	PrtCldy	40							0.05	80	55	
17	PrtCldy	40					20		0.049	80	55	
18	Rain	45					20	1.26	0.044	80	55	0.15
19	Clear	40					20	1.22	0.07	80	55	0.315
20	Cloudy	42					20	1.61	0.077	80	55	0.315
21									0.134	80	55	
22									0.103	80	55	
23	Foggy	32					20	0.28	0.077	80	55	0.315
24	Foggy	32					20		0.085	80	55	
25	Foggy	35					20.	0.89	0.056	80	55	0.315
26	Foggy	38					20		0.049	80	55	
27	PrtCldy	42					20		0.052	80	55	0.315
28									0.054			
29									0.134			
30	Foggy	34					20	1.22	0.109	80	55	0.315
31	Cloudy	37					20	1.24	0.066	80	55	0.315
AVG		38.1364	ERR	ERR	ERR	ERR	20	1.102857	0.067032	80	55	0.294375
MAX		46	ERR	ERR	ERR	ERR	20	1.61	0.134	80	55	0.315
MIN		32	ERR	ERR	ERR	ERR	20	0.28	0.044	80	55	

City Of Plummer Month of Nov 2000

Date	Weather	Temp (F)	PH Pond 1	PH Pond 2	DO Pond 1	DO Pond 2	Feed Rate Lbs/day	Residual mg/l	Influent (MGD)	Mix Hrs Pond 1	Mix Hrs Pond 2	Flow (MGD) Effluent
1	Foggy	33							0.056	80	55	
2	Foggy	30							0.056	80	55	
3	Foggy	28							0.054	80	55	
4									0.057			
5									0.081			
6	Foggy	34							0.071	80	55	
7	Foggy	27							0.062	80	55	
8	Snow	33							0.052	80	55	
9	Snow	32							0.056	80	55	
10	Cloudy	16							0.083	80	55	
11									0.067			
12									0.073			
13	Clear	14							0.059	80	55	
14	Clear	12							0.056	80	55	
15	Cloudy	20							0.059	80	55	
16	Cloudy	28							0.054	80	55	
17	Cloudy	25							0.059	80	55	
18									0.061			
19									0.066			
20	Foggy	15							0.073	80	55	
21	Foggy	18							0.067	80	55	
22	Foggy	15							0.065	80	55	
23									0.062			
24									0.066			
25									0.066			

26										0.071		
27	Rain	35								0.095	80	55
28	Foggy	24								0.072	80	55
29	Cloudy	30								0.056	80	55
30	Snow	30								0.074	80	55
31												
	AVG	24.95			ERR	ERR	ERR	ERR	ERR	ERR	0.064967	80	55
	MAX	35			ERR	ERR	ERR	ERR	ERR	ERR	0.095	80	55
	MIN	12			ERR	ERR	ERR	ERR	ERR	ERR	0.052	80	55

City Of Plummer Month of Dec 2000

Date	Weather	Temp (F)			PH Pond 1	PH Pond 2	DO Pond 1	DO Pond 2	Feed Rate Lbs/day	Residual mg/l	Influent (MGD)	Mix Hrs Pond 1	Mix Hrs Pond 2	Flow (MGD) Effluent
1	Cloudy	32							5		0.064	80	55	0.1
2											0.06			0.1
3											0.065			0.1
4	PrtCldy	30				7.29		7	5	0.77	0.064	80	55	0.1
5	Cloudy	28							5		0.069	80	55	0.1
6	Cloudy	28				7.14		7	5	0.37	0.066	80	55	0.1
7	Snow	28							5		0.062	80	55	0.1
8	Cloudy	27				7.23		7	5	0.33	0.055	80	55	0.1
9											0.053			
10											0.066			
11	Clear	19				7.32		5	5	0.17	0.083	80	55	0.1
12	Clear	10							5		0.078	80	55	0.1
13	Cloudy	14				7.39		10	5	0.33	0.054	80	55	0.1
14	Cloudy	17							5		0.078	80	55	0.1
15	Clear	18				7.5		4	5	0.27	0.078	80	55	0.1
16											0.075			
17											0.097			
18	Foggy	18				7.48		5	5	0.15	0.056	80	55	0.1
19	Snow	28							5		0.044	80	55	0.1
20	Foggy	18				7.33		12	5	0.3	0.06	80	55	0.1
21	Cloudy	22							5		0.083	80	55	0.1
22	Cloudy	30				7.17		7	5	0.33	0.065	80	55	0.1
23											0.077	80	55	0.1
24											0.106	80	55	0.1
25											0.141	80	55	0.1
26	PrtCldy	34							5		0.107	80	55	0.1
27	PrtCldy	36				7.23		9	5	0.32	0.093	80	55	0.1
28	Foggy	28							5		0.122	80	55	0.1
29	Foggy	29				7.15		10	5	0.29	0.116	80	55	0.1
30											0.098			
31											0.089			
	AVG	24.7			ERR	7.29364	ERR	7.54545	5	0.33	0.078194	80	55	0.1
	MAX	36			ERR	7.5	ERR	12	5	0.77	0.141	80	55	0.1
	MIN	10			ERR	7.14	ERR	4	5	0.15	0.044	80	55	0.1
	AVG	23.9381	ERR	ERR	ERR	7.29797	ERR	7.65734	ERR		0.094607			
	MAX	36	ERR	ERR	ERR	7.5	ERR	12	ERR		0.311			
	MIN	10	ERR	ERR	ERR	7.14	ERR	4	ERR		0.03			

City Of Plummer Month of Jan 2002

Date	Weather	Temp (F)	Temperature Pond 1	Temperature Pond 2	PH Pond 1	PH Pond 2	DO Pond 1	DO Pond 2	Feed Rate Lbs/day	Residual mg/l	Influent (MGD)	Mixing Pond 1	Mixing Pond 2	Flow (MGD) Effluent
1											0.23			
2	Cloudy	28		4.3		6.69		2	5	0.44	0.25	55	80	0.1
3											0.28	55	80	0.1
4	Cloudy	32		5.7		6.72		3	5	0.36	0.03	55	80	0.1
5												55	80	0.1
6												55	80	0.1
7	Rainy	40									0.132	55	80	0.1
8	cloudy	42									0.147	55	80	0.1
9	Cloudy	35		4.6		6.68		3	5	0.04	0.378	55	80	0.1
10	Overcast	30									0.203	55	80	0.1
11	Cold	28		4.9		6.74		4	5	0.32	0.125	55	80	0.1
12												55	80	0.1
13												55	80	0.1
14	Cold	24		3.6		6.77		3	5	0.08	0.077	55	80	0.1
15	Cold	20										55	80	0.1
16	Cold	19		4.8		6.92		4	5	0.48	0.153	55	80	0.1
17	Snowy	24									0.043	55	80	0.1
18	Cold	20		4.7		6.87		2	5		0.04	55	80	0.1
19												55	80	0.1
20												55	80	0.1
21		34		3.7		6.88		3	5	0.35	0.047	55	80	0.1
22											0.05	55	80	0.1
23		30		3.4		6.77		3	5	0.16	0.042	55	80	0.1
24	Rainy	34									0.043	55	80	0.1
25	Rainy	36							5		0.135	55	80	0.1
26											0.082	55	80	0.1
27											0.406	55	80	0.1
28	cold	8		4.3		7.02		0.2	5	0.18	0.229	55	80	0.1
29		20									0.142	55	80	0.1
30	Snowy	24		5.2		7.04		13	5	0.13	0.082	55	80	0.1
31	Clean	34									0.085	55	80	0.1
	AVG	28.1	ERR	4.47273	ERR	6.82727	ERR	3.65455	5	0.254	0.14296	55	80	0.1
	MAX	42	ERR	5.7	ERR	7.04	ERR	13	5	0.48	0.406	55	80	0.1
	MIN	8	ERR	3.4	ERR	6.68	ERR	0.2	5	0.04	0.03	55	80	0.1

City Of Plummer Month of Feb.

Date	Weather	Temp (F)	Temp. Pond 1	Temp. Pond 2	PH Pond 1	PH Pond 2	DO Pond 1	DO Pond 2	Feed Rate Lbs/day	Residual mg/l	Influent (MGD)	Mixing Hours	Mixing Hours	Flow (MGD) Effluent
1	Sunny	34		4.1		6.72			7	0.16	0.078	55	80	0.1
2									7		0.072	55	80	0.1
3									7		0.072	55	80	0.1
4	Clear	28		3.4		7.07			7	0.4	0.069	55	80	0.1
5	Clear	24		3.4		7.07			7		0.067	55	80	0.1
6	Clear	24		3.6		7.03			5	0.24	0.069	55	80	0.1
7	Clear	22		3.6		7.03			5		0.068	55	80	0.1
8	Clear	22		3.5		7.02			5	0.16	0.131	55	80	0.1
9	Clear	22		3.5		7.02			5		0.204	55	80	0.1
10	Clear	22		3.5		7.02			5		0.16	55	80	0.1
11	Clear	24		3.6		7.05			5	0.17	0.148	55	80	0.1
12	Cold	8		3.6					5		0.142	55	80	0.1
13	Cold	12		4.3					5	0.17	0.086	55	80	0.1
14	Cold	123		4.1					5		0.097	55	80	0.1
15	Cold	12		4.3		7.05			5	0.17	0.086	55	80	0.1
16	Cold	12		4.3		7.05			5		0.082	55	80	0.1
17	Cold	12		4.3		7.05			5		0.079	55	80	0.1
18									7		0.092	55	80	0.1
19	Cold	32							7		0.14	55	80	0.1
20	Cold	29		4.8					7	0.08	0.245	55	80	0.1
21	Rainy	32							7		0.397	55	80	0.1
22	Rainy	44							7		0.192	55	80	0.1
23									7		0.192	55	80	0.1
24									7		0.275	55	80	0.1
25	Cold	6		3.3					7	0.01	0.035	55	80	0.1
26	Cold	12							7		0.135	55	80	0.1
27	Cold	16		2.9					7		0.092	55	80	0.1

28	Cold	20							7		0.092	55	80	0.1
29														
30														
31														
	AVG	25.73913	ERR	3.78333	ERR	7.015	ERR	ERR	6.1428571	0.173333	0.12846	55	80	0.1
	MAX	123	ERR	4.8	ERR	7.07	ERR	ERR	7	0.4	0.397	55	80	0.1
	MIN	6	ERR	2.9	ERR	6.72	ERR	ERR	5	0.01	0.035	55	80	0.1

City Of Plummer Month of March

Date	Weather	Temp (F)	Temp. Pond 1	Temp. Pond 2	PH Pond 1	PH Pond 2	DO Pond 1	DO Pond 2	Feed Rate Lbs/day	Residual mg/l	Influent (MGD)	Mixing Hours	Mixing Hours	Flow (MGD) Effluent
1	Cold	22		4.5		6.9		2	7	0.19	0.081	55	80	0.1
2									7		0.069	55	80	0.1
3									7		0.058	55	80	0.1
4	Cold	24		4.7		6.85		2	7	0.36	0.057	55	80	0.1
5	Cold	34							7	0.05	0.056	55	80	0.1
6	Snowy	14		3.7		7.01		3	7	0.18	0.08	55	80	0.1
7	Snowy	14		3.7		7.01		3	7	0.18	0.08	55	80	0.1
8	Snowy	14		3.7		7.01		3	7	0.18	0.08	55	80	0.1
9									5		0.073	55	80	0.1
10									5		0.064	55	80	0.1
11		34							5		0.132	55	80	0.1
12									5		0.159	55	80	0.2
13	Snowy	32		5		6.85		3	5	0.17	0.107	55	80	0.2
14									5		0.288	55	80	0.2
15	Snowy	28		6		7.04		2	5	0.23	0.105	55	80	0.2
16									5		0.174	55	80	0.2
17									5		0.136	55	80	0.1
18	Snowy	28		6		7.04		2	5	0.23	0.105	55	80	0.1
19	Cold	30							5		0.081	55	80	0.1
20	Snowy	30		6.9		6.94		2	5	0.25	0.155	55	80	0.2
21	Cold	12							5		0.316	55	80	0.2
22	Cold	28		5.3		7.02		2	5	0.21	0.213	55	80	0.2
23									5		0.253	55	80	0.2
24									5		0.279	55	80	0.2
25	Rainy	34		6.2		6.89		2	5	0.23	0.268	55	80	0.2
26	Foggy	36							5		0.176	55	80	0.2
27	Clear	34		6		6.98		2	5	0.23	0.198	55	80	0.2
28	Cloudy	36							5		0.144	55	80	0.2
29	Cool	34		8.3		6.75		3	5	0.28	0.117	55	80	0.2
30											0.082	55	80	0.2
31											0.073	55	80	0.2
	AVG	27.26316	ERR	5.38462	ERR	6.94538	ERR	2.38462	5.5517241	0.212143	0.13739	55	80	0.1548387
	MAX	36	ERR	8.3	ERR	7.04	ERR	3	7	0.36	0.316	55	80	0.2
	MIN	12	ERR	3.7	ERR	6.75	ERR	2	5	0.05	0.056	55	80	0.1

City Of Plummer Month of April

Date	Weather	Temp (F)	Temp. Pond 1	Temp. Pond 2	PH Pond 1	PH Pond 2	DO Pond 1	DO Pond 2	Feed Rate Lbs/day	Residual mg/l	Influent (MGD)	Mixing Hours	Mixing Hours	Flow (MGD) Effluent
1	Cool	37		8.1		6.75		2	5	0.14	0.096	55	80	0.2
2	Cool	34							5		0.068	55	80	0.2
3	Cold	30		7.3		6.98		2	5	0.19	0.058	55	80	0.15
4									5		0.05	55	80	0.1
5	Warm	39		7.4		6.96		2	5	0.17	0.044	55	80	0.1
6									5		0.045	55	80	0.1
7									5		0.045	55	80	0.1
8	Warm	40		7.3		6.97		2	5	0.16	0.045	55	80	0.1
9									5		0.045	55	80	0.1
10	Rainy	42		7.4		6.98		2	5	0.14	0.132	55	80	0.1
11											0.146	55	80	0.1
12	Cloudy	40		7.3		6.97		2	5	0.14	0.1321	55	80	0.2
13											0.157	55	80	0.2
14											0.159	55	80	0.2
15	Cloudy	38		11.5		6.95		5	5	0.33	0.196	55	80	0.2
16		36							5		0.1102	55	80	0.2
17	cool	36		10.1		6.98		3	5	0.29	0.122	55	80	0.2

18	Sunny	40							5		0.107	55	80	0.2
19	Sunny	40		11.2		6.98		3	5	0.17	0.084	5	80	0.15
20											0.073	55	80	0.1
21											0.061	55	80	0.1
22	Cool	40		13.1		6.92		5	5	0.06	0.059	55	80	0.1
23											0.054	55	80	0.1
24		34		11.7		6.88		3	5	0.26	0.052	55	80	0.1
25											0.049	55	80	0.1
26		36		11.8		6.98		3	5	0.16	0.047	55	80	0.1
27											0.044	55	80	0.1
28											0.011	55	80	0.1
29	Clear	60		15.1		6.78		3	5	0.3	0.002	55	80	0.1
30	Cloudy	40									0.003	55	80	0.1
31														
	AVG	38.94118	ERR	9.94615	ERR	6.92923	ERR	2.84615	5	0.193077	0.07654	53.333	80	0.1333333
	MAX	60	ERR	15.1	ERR	6.98	ERR	5	5	0.33	0.196	55	80	0.2
	MIN	30	ERR	7.3	ERR	6.75	ERR	2	5	0.06	0.002	5	80	0.1

City Of Plummer Month of May

Date	Weather	Temp (F)	Temp. Pond 1	Temp. Pond 2	PH Pond 1	PH Pond 2	DO Pond 1	DO Pond 2	Feed Rate Lbs/day	Residual mg/l	Influent (MGD)	Mixing Hours	Mixing Hours	Flow (MGD) Effluent
1	Sunny	42		12.4		6.9		3	5	0.17	0.049	55	80	0.1
2									5		0.042	55	80	0.1
3	Sunny	42		13.9		6.89		5	5	0.24	0.042	55	80	0.1
4									5			55	80	0.1
5									5		0.041	55	80	0.1
6	Cold	30		13.4		6.9		4	5	0.18	0.051	55	80	0.1
7	Cold	30						2	5		0.42	55	80	0.1
8	Sunny	36						2	5	0.18	0.044	55	80	0.1
9	Sunny	32		11.3		6.9		2	5	0.17	0.038	55	80	0.1
10	Sunny	32		11.3		6.9		2	5	0.17	0.038	55	80	0.1
11									5		0.035	55	80	0.1
12									5		0.032	55	80	0.1
13	Sunny	36		11.4		6.91		3	5	0.21	0.036	55	80	0.1
14	Cloudy	34							5		0.034	55	80	0.1
15	Sunny	36		13.4		6.9		3	5	0.23	0.033	55	80	0.1
16									5		0.03	55	80	0.1
17	Rainy	42		15.6		6.8		1	5	0.04	0.029	55	80	0.1
18									5		0.0287	55	80	0.1
19									5		0.026	55	80	0.1
20	Cloudy	40		15.7		6.88		1	5	0.03	0.022	55	80	0.1
21	Cloudy	40							5		0.024	55	80	0.1
22	Cloudy	40		13.2		6.87		1	5	0.06	0.03	55	80	0.1
23	Sunny	42							5		0.202	55	80	0.1
24	Sunny	44		14		6.3		2	5	0.04	0.079	55	80	0.1
25									5		0.039	55	80	0.1
26									5		0.031	55	80	0.1
27									5		0.028	55	80	0.1
28									5		0.029	55	80	0.1
29	Cloudy	50							5		0.078	55	80	0.1
30									5		0.027	55	80	0.1
31				18.6		6.85		2	5	0.35	0.03	55	80	0.1
	AVG	38.11765	ERR	13.6833	ERR	6.83333	ERR	2.35714	5	0.159231	0.05559	55	80	0.1
	MAX	50	ERR	18.6	ERR	6.91	ERR	5	5	0.35	0.42	55	80	0.1
	MIN	30	ERR	11.3	ERR	6.3	ERR	1	5	0.03	0.022	55	80	0.1

City Of Plummer Month of June

Date	Weather	Temp (F)	Temp. Pond 1	Temp. Pond 2	PH Pond 1	PH Pond 2	DO Pond 1	DO Pond 2	Feed Rate Lbs/day	Residual mg/l	Influent (MGD)	Mixing Hours	Mixing Hours	Flow (MGD) Effluent
1											0.027	55	80	0.1
2											0.025	55	80	0.1
3											0.026	55	80	0.1
4											0.023	55	80	0.1
5											0.019	55	80	0.1
6	Cool	50		15.7		6.86		3			0.021	55	80	0.1
7	Cloudy	42									0.018	55	80	0.1

Date	Weather	Temp (F)	Temp. Pond 1	Temp. Pond 2	PH Pond 1	PH Pond 2	DO Pond 1	DO Pond 2	Feed Rate Lbs/day	Residual mg/l	Influent (MGD)	Mixing Hours	Mixing Hours	Flow (MGD) Effluent
8											0.029	55	80	0.1
9											0.028	55	80	0.1
10	Cloudy	46									0.03	55	80	0.1
11	Cloudy	48										55	80	0.1
12	Warm	55									0.069	55	80	0.1
13											0.082	55	80	0.1
14	Warm	70									0.086	55	80	0.1
15											0.076	55	80	0.1
16											0.067	55	80	0.1
17		42									0.072	55	80	0.1
18											0.082	55	80	0.1
19											0.122	55	80	0.1
20	Warm	70		18.1		7		4			0.091	55	80	0.1
21											0.097	55	80	0.1
22											0.082	55	80	0.1
23											0.067	55	80	0.1
24	Hot										0.066	55	80	0.1
25	Hot										0.067	55	80	0.1
26	Hot										0.064	55	80	0.1
27	Hot										0.065	55	80	0.1
28												55	80	0.1
29												55	80	0.1
30														
31														
	AVG	52.875	ERR	16.9	ERR	6.93	ERR	3.5	ERR	ERR	0.05773	55	80	0.1
	MAX	70	ERR	18.1	ERR	7	ERR	4	ERR	ERR	0.122	55	80	0.1
	MIN	42	ERR	15.7	ERR	6.86	ERR	3	ERR	ERR	0.018	55	80	0.1

City Of Plummer Month of July

Date	Weather	Temp (F)	Temp. Pond 1	Temp. Pond 2	PH Pond 1	PH Pond 2	DO Pond 1	DO Pond 2	Feed Rate Lbs/day	Residual mg/l	Influent (MGD)	Mixing Hours	Mixing Hours	Flow (MGD) Effluent
1	Sunny								25	0.18	0.058			
2									25	0.16	0.06			
3									25	0.06	0.065			
4									25	0.05	0.067			
5									25	0.02	0.069			
6									25	0.17	0.071			
7									25	0.08	0.062			
8									25	0.06	0.062			
9									25	0.05	0.066			
10									25	0.08	0.067			
11									25	0.08	0.067			
12									25	0.08	0.068			
13									25	0.05	0.069			
14									25	0.04	0.067			
15									25	0.04	0.069			
16									25	0.03	0.061			
17									25	0.02	0.062			
18									25	0.02	0.062			
19									25	0.03	0.064			
20									25	0.04	0.06			
21									25	0.05	0.061			
22									25	0.06	0.07			
23									25	0.02	0.068			
24									25	0.02	0.063			
25									25	0.03	0.067			
26									25	0.01	0.065			
27									25	0.03	0.056			
28									25	0.06	0.06			
29									25	0.05	0.077			
30									25	0.02	0.096			
31										0.02	0.109			
	AVG	ERR	ERR	ERR	ERR	ERR	ERR	ERR	25	0.055161	0.06735	ERR	ERR	ERR
	MAX	ERR	ERR	ERR	ERR	ERR	ERR	ERR	25	0.18	0.109	ERR	ERR	ERR
	MIN	ERR	ERR	ERR	ERR	ERR	ERR	ERR	25	0.01	0.056	ERR	ERR	ERR

Month of Jan

Temp (F)	Temp. Pond 1	Temp. Pond 2	PH Pond 1	PH Pond 2	DO Pond 1	DO Pond 2	Feed Rate Lbs/day	Residual mg/l	Influent (MGD)	Mixing Hours	Mixing Hours	Flow (MGD) Effluent
									0.01	80	55	0.1
28		4.1		7.76		10	0.5	0.64	0.07	80	55	0.1
25							0.5		0.01	80	55	0.1
2							0.5		0.05	80	55	0.1
40		5.1		7.31		16		0.52	0.33	80	55	0.1
									0.44			
									0.271			
20		3.1		7.3		5	0.5	0.37	0.223	80	55	0.1
30							0.5		0.094	80	55	0.1
28		4		7.31		5	0.5	0.42	0.161	80	55	0.1
28							0.5		0.125	80	55	0.1
30		4.2		7.29		3	0.5	0.55	0.169	80	55	0.1
									0.189			
									0.184			
25		3.4		7.29		3	0.5	0.68	0.188	80	55	0.1
18							0.5		0.096	80	55	0.1
18		3.2		7.3		3	0.5	0.63	0.094	80	55	0.1
20							0.5		0.051	80	55	0.1
28		3.5		7.37		5	0.5	0.8	0.067	80	55	0.1
									0.067			
									0.073			
34		3.9		7.19		7	0.5	0.54	0.11	80	55	0.1
25							0.5		0.183	80	55	0.1
24		3.6		7.26		5	0.5	0.67	0.101	80	55	0.1
28							0.5		0.054	80	55	0.1
22		3.5		7.31		10	0.5	0.47	0.057	80	55	0.1
									0.084			
		3.3							0.01			
24				7.18		8	0.5	0.35	0.09	80	55	0.1
25							0.5		0.069	80	55	0.1
28		3.2		7.3		8	0.5	0.5	0.088	80	55	0.1
25	ERR	3.7	ERR	7.3208	ERR	6.7692	0.5	0.54923	0.1266	80	55	0.1
40	ERR	5.1	ERR	7.76	ERR	16	0.5	0.8	0.44	80	55	0.1
2	ERR	3.1	ERR	7.18	ERR	3	0.5	0.35	0.01	80	55	0.1

Month of Feb.

Temp (F)	Temp. Pond 1	Temp. Pond 2	PH Pond 1	PH Pond 2	DO Pond 1	DO Pond 2	Feed Rate Lbs/day	Residual mg/l	Influent (MGD)	Mixing Hours	Mixing Hours	Flow (MGD) Effluent
25							0.05		0.101	80	55	0.1
30		3.8		7.27		4	0.05	0.47	0.05	80	55	0.1
									0.19			
									0.201			
34		3.6		7.33		3	0.05	0.011	0.229	80	55	0.1
25							0.05		0.202	80	55	0.1
14		3.1		7.41		4	0.05	0.012	0.134	80	55	0.1
8						7	0.05		0.084	80	55	0.1
18		3.3		7.34		8	0.05	0.012	0.059	80	55	0.1
									0.031			
									0.048			
15		3.7		7.31		8	0.05	0.011	0.066	80	55	0.1
22							0.05		0.092	80	55	0.1
18		4		7.16		12	0.05	0.028	0.099	80	55	0.1
26							0.05		0.091	80	55	0.1

20		3.5		7.15		5	0.05	0.048	0.048	80	55	0.1
									0.048			
									0.045			
									0.127			
18		3.4		7.15		0.03	0.05	0.028	0.138	80	55	0.1
32							0.05		0.098	80	55	0.1
36							0.05		0.116	80	55	0.1
30		4.4		7.08		3	0.05	0.068	0.213	80	55	0.1
									0.138			
									0.157			
10		5		7.14		10	0.05	0.07	0.165	80	55	0.1
12							0.05		0.115	80	55	0.1
10		2.7		7.15		8	0.05	0.074	0.09	80	55	0.1
21.21053	ERR	3.68182	ERR	7.2264	ERR	6.0025	0.05	0.07564	0.11339	80	55	0.1
36	ERR	5	ERR	7.41	ERR	12	0.05	0.47	0.229	80	55	0.1
8	ERR	2.7	ERR	7.08	ERR	0.03	0.05	0.011	0.031	80	55	0.1

Month of March

Temp (F)	Temp. Pond 1	Temp. Pond 2	PH Pond 1	PH Pond 2	DO Pond 1	DO Pond 2	Feed Rate Lbs/day	Residual mg/l	Influent (MGD)	Mixing Hours	Mixing Hours	Flow (MGD) Effluent
15							0.05		0.095	80	55	0.1
34	4.9			7.14		3	0.05	0.023	0.342	80	55	0.1
									0.233			
									0.261			
38	6.3			7.13		3	0.05	0.05	0.291	80	55	0.1
30							0.05		0.197	80	55	0.1
28	5.3			7.15		3	0.05	0.053	0.182	80	55	0.1
25							0.05		0.203	80	55	0.1
35	5.5			7.13		9	0.05	0.044	0.132	80	55	0.1
									0.307			
									0.267			
34	5.3			7.12		20	0.05	0.032	0.332	80	55	0.1
40							0.05		0.202	80	55	0.1
28	5.5			7.09		8	0.05	0.032	0.188	80	55	0.1
25							0.05		0.06	80	55	0.1
32	6.2			7.03		10	0.05	0.021	0.082	80	55	0.1
									0.155			
									0.194			
40	7.5			6.95		13	0.05	0.019	0.252	80	55	0.1
28							0.05		0.18	80	55	0.1
25	6.8			6.94		0.04	0.05	0.017	0.095	80	55	0.1
28							0.05		0.042	80	55	0.1
26	7.5			6.88		0.04	0.05	0.017	0.082	80	55	0.1
									0.1287			
									0.121			
40	8.6			6.85		0.08	0.05	0.09	0.175	80	55	0.1
28							0.05		0.154	80	55	0.1
36	8.4			6.9		0.05	0.05	0.03	0.154	80	55	0.1
32						0	0.05		0.301	80	55	0.1
32	8.1			6.92		0.06	0.05	0.06	0.108	80	55	0.1
									0.052	80	55	0.1
30.86364	6.6077	ERR	ERR	7.0177	ERR	4.9479	0.05	0.03754	0.1796	80	55	0.1
40	8.6	ERR	ERR	7.15	ERR	20	0.05	0.09	0.342	80	55	0.1
15	4.9	ERR	ERR	6.85	ERR	0	0.05	0.017	0.042	80	55	0.1

Month of April

Temp (F)	Temp. Pond 1	Temp. Pond 2	PH Pond 1	PH Pond 2	DO Pond 1	DO Pond 2	Feed Rate Lbs/day	Residual mg/l	Influent (MGD)	Mixing Hours	Mixing Hours	Flow (MGD) Effluent
									0.067	80	55	0.1
32		8.6		6.91		6	0.05	0.07	0.252	80	55	0.1
30							0.05		0.147	80	55	0.1
26		7.6		6.95		6	0.05	0.11	0.207	80	55	0.1
25							0.05		0.134	80	55	0.1
36		9		6.76		6	0.05	0.09	0.096	80	55	0.1
							0.05		0.223	80	55	0.1
							0.05		0.141	80	55	0.1
35		8.2		6.82		8	0.05	0.06	0.234	80	55	0.1
32							0.05		0.123	80	55	0.1
32		7.6		6.83			0.05	0.07	0.097	80	55	0.1
25							0.05		0.138	80	55	0.1
32		8.1		6.81		14	0.05	0.16	0.176	80	55	0.1
									0.352	80	55	0.1
									0.17	80	55	0.1
28		10		6.78		6	0.05	0.03	0.137	80	55	0.1
45							0.05		0.128	80	55	0.1
42		11.4		6.79		12	0.05	0.06	0.119	80	55	0.1
40							0.05		0.134	80	55	0.1
50		9.5		6.73		13	0.05	0.02	0.172	80	55	0.1
							0.05		0.131	80	55	0.1
							0.05		0.119	80	55	0.1
40		11.1		6.5		5	0.05	0.02	0.119	80	55	0.1
40							0.05		0.119	80	55	0.1
60		15.2		6.876		8	0.05	0.04	0.112	80	55	0.1
55							0.05		0.116	80	55	0.1
70		14.3		6.65		5	0.05	0.08	0.132	80	55	0.1
							0.05		0.133	80	55	0.1
40							0.05		0.217	80	55	0.1
40		11.3		6.74		1	0.05	0.02	0.262	80	55	0.1
										80	55	0.1
38.86364	ERR	10.1462	ERR	6.7805	ERR	7.5	0.05	0.06385	0.16	80	55	0.1
70	ERR	15.2	ERR	6.95	ERR	14	0.05	0.16	0.352	80	55	0.1
25	ERR	7.6	ERR	6.5	ERR	1	0.05	0.02	0.096	80	55	0.1

Month of May

Temp (F)	Temp. Pond 1	Temp. Pond 2	PH Pond 1	PH Pond 2	DO Pond 1	DO Pond 2	Feed Rate Lbs/day	Residual mg/l	Influent (MGD)	Mixing Hours	Mixing Hours	Flow (MGD) Effluent
32							10		0.216	55	80	0.2
32		10.1		6.86		5	10	0.04	0.154	55	80	0.2
35							10		0.054	55	80	0.2
45		11.7		6.71		1	10	0.01	0.083	55	80	0.2
							10		0.155	55	80	0.2
							10		0.155	55	80	0.2
33		11.7		6.69		2	10	0.01	0.16	55	80	0.2
40							10		0.056	55	80	0.2
40		14.5		7.08		3	10	0.01	0.067	55	80	0.2
45							10		0.102	55	80	0.2
45		13.4		6.95		2	10	0	0.104	55	80	0.2
							10		0.103	55	80	0.2
							10		0.117	55	80	0.2

45		14.7		6.8		2	10	0.04	0.12	55	80	0.2
40							10		0.115	55	80	0.2
38		12.8		6.9		10	10	0.02	0.188	55	80	0.2
40							10		0.252	55	80	0.2
36		12.8		6.97		2	10	0.45	0.179	55	80	0.2
							10		0.145	55	80	0.2
							10		0.135	55	80	0.2
42		12.7		6.99		2	10	0.02	0.125	55	80	0.2
51							10		0.118	55	80	0.2
585		16.4		6.89		2	10	0.05	0.11	55	80	0.2
57							10		0.108	55	80	0.2
61		18		6.71		6	10	0.05	0.097	55	80	0.2
							10		0.082	55	80	0.2
							10		0.075	55	80	0.2
							10		0.074	55	80	0.2
40		13.9		6.89		3	10	0.01	0.086	55	80	0.2
44		13.9		6.96		3	10	0.19	0.079	55	80	0.2
55							10		0.082	55	80	
67.31818	ERR	13.5846	ERR	6.8769	ERR	3.3077	10	0.06923	0.11923	55	80	0.2
585	ERR	18	ERR	7.08	ERR	10	10	0.45	0.252	55	80	0.2
32	ERR	10.1	ERR	6.69	ERR	1	10	0	0.054	55	80	0.2

Month of June

Temp (F)	Temp. Pond 1	Temp. Pond 2	PH Pond 1	PH Pond 2	DO Pond 1	DO Pond 2	Feed Rate Lbs/day	Residual mg/l	Influent (MGD)	Mixing Hours	Mixing Hours	Flow (MGD) Effluent
62							10		0.079	55	80	
									0.081	55	80	
									0.073	55	80	
38							20	0.66	0.069	55	80	0.31
41							20		0.092	55	80	
50							20	0.08	0.106	55	80	0.32
52							20		0.098	55	80	
50								0.2	0.085	55	80	0.32
							20		0.08	55	80	
							20		0.095	55	80	
46							20	0.08	0.087	55	80	0.303
38							20		0.114	55	80	
42							20	0.19	0.108	55	80	0.338
48							20		0.095	55	80	
39							20	0.2	0.092	55	80	0.291
								0.086		55	80	
									0.079	55	80	
50							20	0.07	0.09	55	80	0.29
46							20		0.089	55	80	
50							20	0.22	0.095	55	80	0.333
56									0.079	55	80	
60							20	0.19	0.08	55	80	0.325
									0.067	55	80	
									0.065	55	80	
48							20	0.06	0.072	55	80	0.356
50							20		0.08	55	80	
58							20	0.08	0.082	55	80	0.328
58							20		0.182	55	80	
50							20	0.39	0.127	55	80	0.397
									0.096	55	80	
49.14286	ERR	ERR	ERR	ERR	ERR	ERR	19.52381	0.19277	0.09093	55	80	0.3259167

62	ERR	ERR	ERR	ERR	ERR	ERR	20	0.66	0.182	55	80	0.397
38	ERR	ERR	ERR	ERR	ERR	ERR	10	0.06	0.065	55	80	0.29

Month of July

Temp (F)	Temp. Pond 1	Temp. Pond 2	PH Pond 1	PH Pond 2	DO Pond 1	DO Pond 2	Feed Rate Lbs/day	Residual mg/l	Influent (MGD)	Mixing Hours	Mixing Hours	Flow (MGD) Effluent
									0.089	55	80	
55							20	1.78	0.09	55	80	0.381
64							20	2.2	0.087	55	80	0.33
							20		0.08	55	80	
62							20		0.085	55	80	
55							20	0.12	0.075	55	80	0.373
									0.107	55	80	
									0.073	55	80	
50							20	0.12	0.08	55	80	0.521
50							20		0.085	55	80	
54							20	0.1	0.082	55	80	
55							20		0.083	55	80	
51							20	0.12	0.087	55	80	0.481
									0.092	55	80	
									0.086	55	80	
44							20	0.12	0.079	55	80	0.333
54							20		0.09	55	80	
50							20	1.55	0.078	55	80	0.34
54							20		0.076	55	80	
50							20	0.32	0.071	55	80	0.311
									0.075	55	80	
									0.074	55	80	
52							20	0.41	0.09	55	80	0.364
60							20		0.105	55	80	
55							20	1.44	0.081	55	80	0.353
48							20		0.068	55	80	
49							20	0.14	0.072	55	80	0.344
									0.051	55	80	
									0.061	55	80	
40							20	0.04	0.051	55	80	0.249
50							20		0.072	55	80	
52.47619	ERR	ERR	ERR	ERR	ERR	ERR	20	0.65077	0.07953	55	80	0.365
64	ERR	ERR	ERR	ERR	ERR	ERR	20	2.2	0.107	55	80	0.521
40	ERR	ERR	ERR	ERR	ERR	ERR	20	0.04	0.051	55	80	0.249

Month of August

Temp (F)	Temp. Pond 1	Temp. Pond 2	PH Pond 1	PH Pond 2	DO Pond 1	DO Pond 2	Feed Rate Lbs/day	Residual mg/l	Influent (MGD)	Mixing Hours	Mixing Hours	Flow (MGD) Effluent
48							25	1.12	0.072	55	80	0.363
55							25		0.075	55	80	
53							25		0.074	55	80	
									0.073			
									0.075			
52							25	2.2	0.076	55	80	0.357
60							25		0.071	55	80	
48							25	1.6	0.068	55	80	0.347
55							25		0.07	55	80	
50							25		0.07	55	80	

72							25		0.081	55	80	
60							25	0.068	0.067	55	80	0.327
55							25		0.067	55	80	
50							25	2.2	0.072	55	80	0.344
55							25		0.074	55	80	
							25		0.071	55	80	
									0.071			
38									0.073			
48							25		0.08	55	80	
54							25		0.072	55	80	
52							25		0.076	55	80	
45							25		0.083	55	80	
							25		0.071	55	80	
									0.071	55	80	
50							25		0.07	55	80	
52							25		0.068	55	80	
45							25		0.046	55	80	
48							25		0.085	55	80	
60							25		0.08	55	80	
52.3913	ERR	ERR	ERR	ERR	ERR	ERR	25	1.4376	0.07248	55	80	0.3476
72	ERR	ERR	ERR	ERR	ERR	ERR	25	2.2	0.085	55	80	0.363
38	ERR	ERR	ERR	ERR	ERR	ERR	25	0.068	0.046	55	80	0.327

Month of Sept.

Temp (F)	Temp. Pond 1	Temp. Pond 2	PH Pond 1	PH Pond 2	DO Pond 1	DO Pond 2	Feed Rate Lbs/day	Residual mg/l	Influent (MGD)	Mixing Hours	Mixing Hours	Flow (MGD) Effluent
									0.053	80	55	
									0.024	80	55	
									0.063			
42							5		0.073	80	55	
50							5		0.07	80	55	
40							5		0.073	80	55	
38							5		0.069	80	55	
									0.065			
									0.064			
38							5		0.063	80	55	
42							5		0.072	80	55	
43							5		0.067	80	55	
45							5		0.067	80	55	
45							5		0.067	80	55	
									0.077			
									0.066			
52							5		0.075	80	55	
50							5		0.067	80	55	
45							5		0.067	80	55	
35							5		0.068	80	55	
38							5		0.064	80	55	
									0.065	80	55	
									0.065			
45							5		0.073	80	55	
48							5		0.07	80	55	
50							5		0.074	80	55	
50							5		0.072	80	55	
45							5		0.078	80	55	
									0.08			
									0.074			

44.26316	ERR	ERR	ERR	ERR	ERR	ERR	5	ERR	0.0675	80	55	ERR
52	ERR	ERR	ERR	ERR	ERR	ERR	5	ERR	0.08	80	55	ERR
35	ERR	ERR	ERR	ERR	ERR	ERR	5	ERR	0.024	80	55	ERR

Month of October

Temp (F)	Temp. Pond 1	Temp. Pond 2	PH Pond 1	PH Pond 2	DO Pond 1	DO Pond 2	Feed Rate Lbs/day	Residual mg/l	Influent (MGD)	Mixing Hours	Mixing Hours	Flow (MGD) Effluent
38							20	0.36	0.072	80	55	0.346
38							25		0.072	80	55	
32							25	2.2	0.073	80	55	0.2609
27							25		0.072	80	55	
30							25	0.76	0.07	80	55	0.327
									0.075			
									0.077			
48							25	0.78	0.088	80	55	0.329
36							25		0.069	80	55	
30							25	1.76	0.065	80	55	0.319
							25			80	55	
30							25		0.067	80	55	0.31
36							25	0.78	0.072	80	55	
40							25		0.078	80	55	
45							25	2.2	0.075	80	55	
42							25		0.066	80	55	
44							25	2.18	0.071	80	55	0.287
									0.065			
									0.064			
46							25	1.96	0.068	80	55	0.468
							25			80	55	
30							25	2.15	0.065	80	55	0.387
46							25		0.065	80	55	
32							25	2.2	0.073	80	55	0.451
40							25	0.24	0.072	80	55	0.312
42							25	0.24	0.125	80	55	0.346
47							25	0.24	0.132	80	55	0.843
38.04762	ERR	ERR	ERR	ERR	ERR	ERR	24.78261	1.28929	0.07564	80	55	0.3835308
48	ERR	ERR	ERR	ERR	ERR	ERR	25	2.2	0.132	80	55	0.843
27	ERR	ERR	ERR	ERR	ERR	ERR	20	0.24	0.064	80	55	0.2609

Month of Nov.

Temp (F)	Temp. Pond 1	Temp. Pond 2	PH Pond 1	PH Pond 2	DO Pond 1	DO Pond 2	Feed Rate Lbs/day	Residual mg/l	Influent (MGD)	Mixing Hours	Mixing Hours	Flow (MGD) Effluent
40									0.242	55	80	
45							0.1		0.113	55	80	
44									0.069	55	80	
30									0.015	55	80	
32									0.015	55	80	
34									0.012	55	80	
28									0.011	55	80	

34									0.09	55	80	
38									0.091	55	80	
44									0.054	55	80	
36									0.074	55	80	
44									0.037	55	80	
									0.021	55	80	
									0.011	55	80	
36									0.083	55	80	
40									0.089	55	80	
40									0.113	55	80	
									0.161	55	80	
									0.181	55	80	
									0.159	55	80	
									0.03	55	80	
36									0.005	55	80	
32									0.058	55	80	
26									0.038	55	80	
36									0.027	55	80	
32									0.069	55	80	
36.35	ERR	ERR	ERR	ERR	ERR	ERR	0.1	ERR	0.07185	55	80	ERR
45	ERR	ERR	ERR	ERR	ERR	ERR	0.1	ERR	0.242	55	80	ERR
26	ERR	ERR	ERR	ERR	ERR	ERR	0.1	ERR	0.005	55	80	ERR

Month of Dec.

Temp (F)	Temp. Pond 1	Temp. Pond 2	PH Pond 1	PH Pond 2	DO Pond 1	DO Pond 2	Feed Rate Lbs/day	Residual mg/l	Influent (MGD)	Mixing Hours	Mixing Hours	Flow (MGD) Effluent
									0.161	55	80	0.1
									0.166	55	80	0.1
36		4					5		0.079	55	80	0.1
34						4	5	0.21	0.174	55	80	0.1
30		4.4					5		0.74	55	80	0.1
30		2.7				4	5	0.17	0.84	55	80	0.1
27						14	5	0.28	0.77	55	80	0.1
							5	0.28	0.84	55	80	0.1
		3					5		0.09	55	80	0.1
26						4	5	0.27	0.22	55	80	0.1
29		2.6					5		0.22	55	80	0.1
26						3	5	0.23	0.188	55	80	0.1
36							5		0.157	55	80	0.1
34							5		0.122	55	80	0.3
							5		0.263	55	80	0.3
							5		0.153	55	80	0.3
38		3.7				4	5	0.08	0.272	55	80	0.3
24							5		0.151	55	80	0.3
30		2.8				14	5	0.01	0.079	55	80	0.3
34							1		0.099	55	80	0.3
30		3.5				4	1	0.28	0.08	55	80	0.3
							1		0.047	55	80	0.3
							1		0.058	55	80	0.3
20		3.8				15	1	0.16	0.067	55	80	0.3
							1		0.042	55	80	0.3
10		3.4				4	1	0.39	0.032	55	80	0.3
12							1.085		0.032	55	80	0.3
26		3.5				4	7	0.51	0.032	55	80	0.3
							7		0.031	55	80	0.3

							7		0.028	55	80	0.3
30		4				3	7	0.42	0.027	55	80	0.3
28.1	ERR	3.45	ERR	ERR	ERR	6.4167	4.175345	0.25308	0.20194	55	80	0.216129
38	ERR	4.4	ERR	ERR	ERR	15	7	0.51	0.84	55	80	0.3
10	ERR	2.6	ERR	ERR	ERR	3	1	0.01	0.027	55	80	0.1

APPENDIX III

2002 Hydrogeological Report
(Wyatt Engineering)

Groundwater Report for the City of Plummer, Proposed Wastewater Treatment Facility, Land Application Site.

Located in Sections 5, 6, 7 & 8, T46N, R4W, Benewah County, City of Plummer, State of Idaho.

USGS Hydrologic Unit: 17010304

Map

Introduction

This research project was completed for the City of Plummer for the site of their proposed Wastewater Treatment Facility. The total site area is approximately 340 acres located in T46N, R4W, Sections 5, 6, 7 and 8. A much smaller portion of this area is being considered for the land application site (Target Area), and this lies within the northern half of section 8.

Research conducted included a USGS (United States Geological Service), IGS (Idaho Geological Service) and IWR (Idaho Water Resources) literature search, review of well logs in the area. Interviews with Idaho Department of Environmental Quality, and University of Idaho professor Gary Stevens were conducted to reveal any unpublished aquifer information.

Site Overview

Geography

The site is located in Northern Idaho, in the St. Joe River watershed. Plummer Creek bounds the area to the south and east, and flows north easterly approximately 5 miles to Chatcolet Lake. Chatcolet Lake is the furthest southern portion of the St. Joe River drainage and is connected surficially to Lake Coeur d'Alene. The site is generally flat lying with a gentle slope to the south and east, bounded to the north and west by hilly terrain. Refer to Figure 1, Topographic Map. Watershed

The area surrounding Plummer Creek is geologically mapped as the Miocene Priest Rapids Member of the Columbia River Basalt Group, with the surrounding creek bottom land mapped as Miocene and possibly Oligocene sediments. The hills in the northern and western portions of the site are mapped as the upper member of the Wallace Formation of the Pre Cambrian Belt Supergroup. The surficial geology in the middle elevations between the hilly uplands and the creek lowlands is the Pleistocene Palouse Formation, composed of loess soils. These soils exhibit high water storage capacities and some Holocene ash layers which may increase the water retention. The Target Area lies wholly within creek bottom lands mapped Miocene, Oligocene sediments. This formation is described as deeply weathered orange to yellow silt and clay, with pebbles and sand in some areas, overlying Columbia River Basalt (within the Target Area). The typical thickness is 30'. Refer to Figure 2, Geologic Map, Showing the Target Area. Geology

Site Well Locations and Data

Where?

Well logs from wells drilled in Sections 5, 6, 7 & 8 show static water levels ranging from 10' below ground surface (bgs) to 126' bgs. There are seven wells, five in section 7 and two in section 8 that are situated within the same geologic unit as the Target Area. The well locations, the Target Area and the geologic map unit are shown on Figure 2.

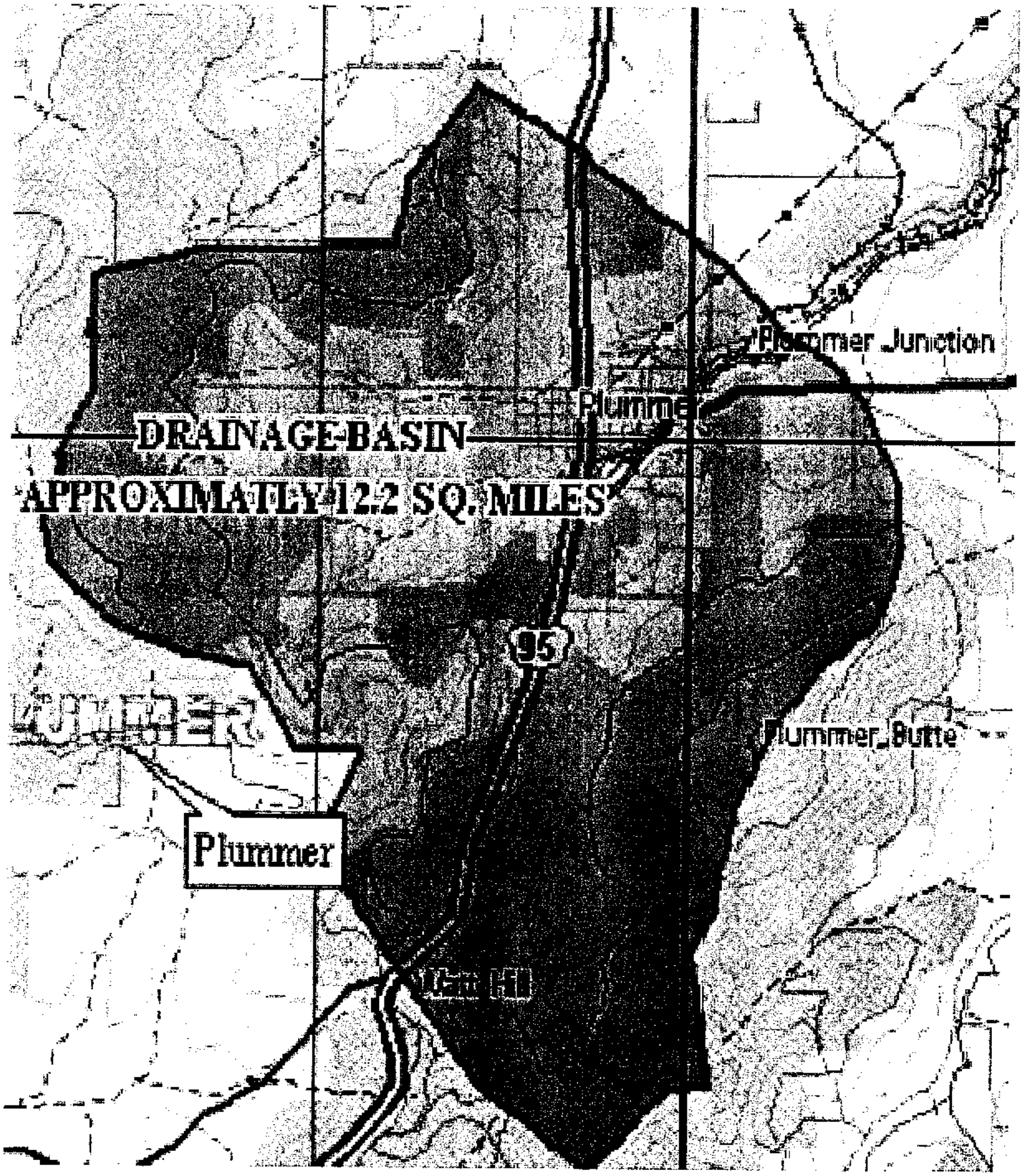
Four of the well logs in section 7 describe between 20' and 32' of surficial soils including clay layers of 3' to 18' thick. The fifth well log describes 23' of surficial soils as "dirt, sand, dirt", and does not differentiate any clay layers. Static water levels for these wells range from 15' bgs to 80' bgs. The two well logs in section 8 describe 6' and 10' of surficial soils, which are noted as clay, and the static water levels are 10' bgs and 100' bgs.

Based on the information gleaned from the well logs within the Miocene Sediment Formation, groundwater should lie between 20' and 30' below ground surface, but could lie as shallow as 10' bgs. The surficial soils exhibit high water retention capacity, high clay content and/or clay layers or lenses. The soils exhibit occasional surface ponding under high moisture conditions.

Conclusions & Recommendations

Most of the wells in the general area exhibit shallow static water levels no matter the final depth of the drilled well. The static water level in one case is at the surface (Union Pacific Railroad). This data indicates a shallow water table, with little to indicate any subsurface confining layers. Most probably, the groundwater aquifer is directly, or at best, indirectly connected to the surface waters of Lake Chatcolet and Lake Coeur d'Alene. There is the possibility that a clay or ash layer in the Target Area may seal surface areas from the underlying groundwater.

The clay content, gentle slope and ponding effect of the soils could provide adequate protection to the underlying aquifers from the effect of land application of treated wastewater. The installation and monitoring of peizometers by the City of Plummer will provide sufficient data to define groundwater levels and seasonal variations.



DRAINAGE BASIN
APPROXIMATLY 12.2 SQ. MILES
Plummer Junction
Plummer
95
Plummer Butte
Plummer

APPENDIX IV

Wastewater Quality Data

State of Idaho, Department of Health and Welfare
Bureau of Laboratories - Coeur d'Alene Branch Lab
2195 Ironwood Court, Coeur d'Alene, Idaho 83814
NON DRINKING WATER - BACTERIAL DENSITY REPORT

LAB: COEUR D'ALENE, Phone: (208) 769-1432
Branch Laboratory Supervisor, Bacteriology: Mike Brodwater

A. BOOTH
BOX B
PLUMMER, ID 83851

Tracking Number: 10993-2830/
(Please Refer to this Tracking Number on any communications)

Storet:
NPDES Number:
Matrix: WATER
Sample Location: PLUMMER IRRIGATION FIELD
Type of Sample: Wastewater, Final
Sample Taken From: Lagoon - G
Collected by: BOOTH
Preservation: Sodium Thiosulfate

Date Collected: 09/07/93 Date Received in Lab: 09/07/93
Time Collected: 08:17 Time Received in Lab:

TEST CODE		**RESULTS**	**COMPLETED**
BDEC	FECAL COLIFORM (STORET # 31616)	4 /100 ML.	09/08/93

State of Idaho, Department of Health and Welfare
Bureau of Laboratories - Coeur d'Alene Branch Lab
2195 Ironwood Court, Coeur d'Alene, Idaho 83814
NON DRINKING WATER - BACTERIAL DENSITY REPORT

LAB: COEUR D'ALENE, Phone: (208) 769-1432
Branch Laboratory Supervisor, Bacteriology: Mike Brodwater

CITY OF PLUMMER ATTN: BOOTH
BOX B
PLUMMER, ID 83851

Tracking Number: 10894-0154/
(Please Refer to this Tracking Number on any communications)

Storet:
NPDES Number: 0022781
Matrix: WATER
Sample Location: WWTP IRRIG FIELD-EFFL
Type of Sample: Wastewater, Chlorinated
Sample Taken From: Sewage Treatment Plant - P
Collected by: BOOTH
Preservation: Not Given

Date Collected: 08/02/94 Date Received in Lab: 08/02/94
Time Collected: 08:36 Time Received in Lab: 10:17

TEST CODE		RESULTS	COMPLETED
BDFC	FECAL COLIFORM (STORET # 31616)	1000 /100 ML.	08/03/94

State of Idaho, Department of Health and Welfare
Bureau of Laboratories - Coeur d'Alene Branch Lab
2195 Ironwood Court, Coeur d'Alene, Idaho 83814
NON DRINKING WATER - BACTERIAL DENSITY REPORT

LAB: COEUR D'ALENE, Phone: (208) 769-1432
Branch Laboratory Supervisor, Bacteriology: Mike Brodwater

CITY OF PLUMMER
BOX B
PLUMMER, ID 83851

Tracking Number: 10895-9800/
(Please Refer to this Tracking Number on any communications)

Storet:
NPDES Number:
Matrix: WATER
Sample Location: IRRIGATION FIELD
Type of Sample: Wastewater
Sample Taken From: Sewage Treatment Plant - P
Collected by: BOOTH
Preservation: Sodium Thiosulfate

Date Collected: 08/03/95 Date Received in Lab: 08/03/95
Time Collected: 13:30 Time Received in Lab:

TEST CODE		**RESULTS**	**COMPLETED**
BDFC	FECAL COLIFORM (STORET # 31616)	84 /100 ML.	08/04/95

State of Idaho, Department of Health and Welfare
Bureau of Laboratories - Coeur d'Alene Branch Lab
2195 Ironwood Court, Coeur d'Alene, Idaho 83814
NON DRINKING WATER - BACTERIAL DENSITY REPORT

LAB: COEUR D'ALENE, Phone: (208) 769-1432
Branch Laboratory Supervisor, Bacteriology: Mike Brodwater

CITY OF PLUMMER
BOX B
PLUMMER, ID 83851

Tracking Number: 10996-2188/
(Please Refer to this Tracking Number on any communications)

Storet:
NPDES Number:
Matrix: WATER
Sample Location: IRR. FIELD WATEWATER TREATMENT
Type of Sample: Wastewater, Chlorinated
Sample Taken From: Lagoon - G
Collected by: BOOTH
Preservation: Sodium Thiosulfate

Date Collected: 09/03/96 Date Received in Lab: 09/03/96
Time Collected: 09:10 Time Received in Lab: 10:37

TEST CODE		**RESULTS**	**COMPLETED**
BDMF	TOTAL COLIFORM (STORET # 31501)	9000 /100 ML.	09/04/96
BDFC	FECAL COLIFORM (STORET # 31616)	310 /100 ML.	09/04/96

State of Idaho, Department of Health and Welfare
Bureau of Laboratories - Coeur d'Alene Branch Lab
2195 Ironwood Court, Coeur d'Alene, Idaho 83814
NON DRINKING WATER - BACTERIAL DENSITY REPORT

LAB: COEUR D'ALENE, Phone: (208) 769-1432
Branch Laboratory Supervisor, Bacteriology: Mike Brodwater

CITY OF PLUMMER
BOX B
PLUMMER, ID 83851

Tracking Number: 10797-8875/
(Please Refer to this Tracking Number on any communications)

Storet:
NPDES Number:
Matrix: WATER
Sample Location: IRRIGATION WWTP
Type of Sample: Wastewater, Chlorinated, Grab
Sample Taken From: Lagoon - G
Collected by: BOOTH
Preservation: Sodium Thiosulfate

Date Collected: 07/15/97 Date Received in Lab: 07/15/97
Time Collected: 09:30 Time Received in Lab: 10:49

TEST CODE		RESULTS	COMPLETED
BDMF	TOTAL COLIFORM (STORET # 31501)	4000 /100 ML.	07/16/97
BDFC	FECAL COLIFORM (STORET # 31616)	210 /100 ML.	07/16/97

State of Idaho, Department of Health and Welfare
Bureau of Laboratories - Coeur d'Alene Branch Lab
2195 Ironwood Court, Coeur d'Alene, Idaho 83814

WATER QUALITY REPORT - CHEMICAL REPORT

LAB: COEUR D'ALENE, Phone: (208) 769-1432
Branch Laboratory Supervisor: Mike Brodwater
Inorganic Chemistry Section: Peggy Albertson PA

CITY OF PLUMMER
CORKY BOOTH
P.O. BOX B
PLUMMER, ID 83851

Tracking Number: 10797-1161/
(Please Refer to this Tracking Number on any communications)

Survey Name: PLUMMER
Storet:
NPDES No.: 002781
Sample Location: PLUMMER IRRIGATION FIELD WWTP
Collected by: BOOTH
Purpose: Compliance
Taken From: Lagoon - G
Type of Sample: Wastewater, Chlorinated, Grab
Composite: No
Preservation: None, H_2SO_4, Cooled 4° C

Date Collected: 07/15/97 Date Received in Lab: 07/15/97
Time Collected: 09:30

STORET	TEST PERFORMED	RESULTS	COMPLETED	ANST
00310	BOD-5	28 (mg/l)	07/22/97	KH
00335	COD	72 (mg/l)	08/01/97	BO
70300	Filterable Residue	267 (mg/l)	07/21/97	KH
00530	Non-filterable Residue (105° C)	31 (mg/l)	07/21/97	KH
00610	Total Ammonia as N	0.298 (mg/l)	07/25/97	BL
00625	Total Kjeldahl Nitrogen as N	6.22 (mg/l)	07/25/97	SR
00630	Total NO2 + NO3 as N	7.08 (mg/l)	07/15/97	SP
00665	Total Phosphorus as P (Low Conc.)	2.5 (mg/l)	07/23/97	SP

State of Idaho, Department of Health and Welfare
Bureau of Laboratories - Coeur d'Alene Branch Lab
2195 Ironwood Court, Coeur d'Alene, Idaho 83814
NON DRINKING WATER - BACTERIAL DENSITY REPORT

LAB: COEUR D'ALENE, Phone: (208) 769-1432
Branch Laboratory Supervisor, Bacteriology: Mike Brodwater

CITY OF PLUMMER
BOX B
PLUMMER, ID 83851

Tracking Number: 10797-9041/
(Please Refer to this Tracking Number on any communications)

Storet:
NPDES Number:
Matrix: WATER
Sample Location: IRRIGATION FIELD WWTP
Type of Sample: Wastewater, Chlorinated, Grab
Sample Taken From: Lagoon - G
Collected by: BOOTH
Preservation: Sodium Thiosulfate

Date Collected: 07/27/97 Date Received in Lab: 07/22/97
Time Collected: 08:10 Time Received in Lab: 09:42

TEST CODE		RESULTS	COMPLETED
BDMF	TOTAL COLIFORM (STORET # 31501)	27,000 /100 ML.	07/23/97

State of Idaho, Department of Health and Welfare
Bureau of Laboratories - Coeur d'Alene Branch Lab
2195 Ironwood Court, Coeur d'Alene, Idaho 83814
NON DRINKING WATER - BACTERIAL DENSITY REPORT

LAB: COEUR D'ALENE, Phone: (208) 769-1432
Branch Laboratory Supervisor, Bacteriology: Mike Brodwater

CITY OF PLUMMER
A F BOOTH
BOX B
PLUMMER, ID 83851

Tracking Number: 10797-9205/
(Please Refer to this Tracking Number on any communications)

Storet:
NPDES Number: ID-22781
Matrix: WATER
Sample Location: WASTEWATER IRRIG FIELD
Type of Sample: Wastewater, Chlorinated, Grab
Sample Taken From: Lagoon - G
Collected by: BOOTH
Preservation: Sodium Thiosulfate

Date Collected: 07/29/97 Date Received in Lab: 07/29/97
Time Collected: 10:14 Time Received in Lab: 11:31

TEST CODE		RESULTS	COMPLETED
BDMF	TOTAL COLIFORM (STORET # 31501)	1600 /100 ML.	07/30/97

State of Idaho, Department of Health and Welfare
Bureau of Laboratories - Coeur d'Alene Branch Lab
2195 Ironwood Court, Coeur d'Alene, Idaho 83814

NON DRINKING WATER - BACTERIAL DENSITY REPORT

LAB: COEUR D'ALENE, Phone: (208) 769-1432
Branch Laboratory Supervisor, Bacteriology: Mike Brodwater

CITY OF PLUMMER
BOX B
PLUMMER, ID 83851

Tracking Number: 10897-9375/
(Please Refer to this Tracking Number on any communications)

Storet:
NPDES Number:
Matrix: WATER
Sample Location: WWTP IRRIGATION FIELD
Type of Sample: Wastewater, Chlorinated, Grab
Sample Taken From: Lagoon - G
Collected by: BOOTH
Preservation: Sodium Thiosulfate

Date Collected: 08/05/97
Time Collected:
Date Received in Lab: 08/05/97
Time Received in Lab: 10:56

TEST CODE		RESULTS	COMPLETED
BDMF	TOTAL COLIFORM (STORET # 31501)	2 /100 ML.	08/06/97

State of Idaho, Department of Health and Welfare
Bureau of Laboratories - Coeur d'Alene Branch Lab
2195 Ironwood Court, Coeur d'Alene, Idaho 83814

WATER QUALITY REPORT - CHEMICAL REPORT

LAB: COEUR D'ALENE, Phone: (208) 769-1432
Branch Laboratory Supervisor: Mike Brodwater
Inorganic Chemistry Section: Peggy Albertson PA

CITY OF PLUMMER
CORKY BOOTH
P.O. BOX B
PLUMMER, ID 83851

Tracking Number: 10897-1436/
(Please Refer to this Tracking Number on any communications)

Survey Name:
Storet:
NPDES No.:
Sample Location: WASTEWATER IRRIGATION FIELD
Collected by: BOOTH
Purpose:
Taken From: Lagoon - G
Type of Sample: Wastewater, Chlorinated, Grab
Composite: No
Preservation: H_2SO_4, Cooled 4° C

Date Collected: 08/12/97 Date Received in Lab: 08/12/97
Time Collected: 09:20

STORET	TEST PERFORMED	RESULTS	COMPLETED	ANST
00310	BOD-5	9 (mg/l)	08/19/97	KH
00335	COD	115 (mg/l)	08/22/97	BO
70300	Filterable Residue	334 (mg/l)	08/14/97	KH
00530	Non-filterable Residue (105° C)	37 (mg/l)	08/14/97	KH
00610	Total Ammonia as N	0.391 (mg/l)	08/14/97	BL
00625	Total Kjeldahl Nitrogen as N	3.49 (mg/l)	08/18/97	BL
00630	Total NO2 + NO3 as N	3.26 (mg/l)	08/20/97	SP
00665	Total Phosphorus as P (Low Conc.)	1.3 (mg/l)	08/13/97	SP

State of Idaho, Department of Health and Welfare
Bureau of Laboratories - Coeur d'Alene Branch Lab
2195 Ironwood Court, Coeur d'Alene, Idaho 83814

NON DRINKING WATER - BACTERIAL DENSITY REPORT

LAB: COEUR D'ALENE, Phone: (208) 769-1432
Branch Laboratory Supervisor, Bacteriology: Mike Brodwater

CITY OF PLUMMER
A F BOOTH
BOX B
PLUMMER, ID 83851

Tracking Number: 10897-9633/
(Please Refer to this Tracking Number on any communications)

Storet:	
NPDES Number:	0022781
Matrix:	WATER
Sample Location:	WW IRRIGATION FIELD
Type of Sample:	Wastewater, Chlorinated, Grab
Sample Taken From:	Lagoon - G
Collected by:	BOOTH
Preservation:	Sodium Thiosulfate

Date Collected: 08/12/97
Time Collected: 09:20

Date Received in Lab: 08/12/97
Time Received in Lab: 10:34

TEST CODE		RESULTS	COMPLETED
BDMPN	TOTAL COLIFORM BACTERIA	300 /100 ML.	08/14/97
BDMPE	FECAL COLIFORM BACTERIA	<2 /100 ML	08/14/97

State of Idaho, Department of Health and Welfare
Bureau of Laboratories - Coeur d'Alene Branch Lab
2195 Ironwood Court, Coeur d'Alene, Idaho 83814
NON DRINKING WATER - BACTERIAL DENSITY REPORT

LAB: COEUR D'ALENE, Phone: (208) 769-1432
Branch Laboratory Supervisor, Bacteriology: Mike Brodwater

CITY OF PLUMMER
BOX B
PLUMMER, ID 83851

Tracking Number: 11097-0856/
(Please Refer to this Tracking Number on any communications)

Storet:
NPDES Number:
Matrix: WATER
Sample Location: WW IRRIGATION FIELD
Type of Sample: Wastewater, Chlorinated, Grab
Sample Taken From: Lagoon - G
Collected by: BOOTH
Preservation: Sodium Thiosulfate

Date Collected: 10/02/97
Time Collected: 07:15

Date Received in Lab: 10/02/97
Time Received in Lab: 10:00

TEST CODE		RESULTS	COMPLETED
BDFC	FECAL COLIFORM (STORET # 31616)	<1 /100 ML.	10/03/97

State of Idaho, Department of Health and Welfare
Bureau of Laboratories - Coeur d'Alene Branch Lab
2195 Ironwood Court, Coeur d'Alene, Idaho 83814
NON DRINKING WATER - BACTERIAL DENSITY REPORT

LAB: COEUR D'ALENE, Phone: (208) 769-1432
Branch Laboratory Supervisor, Bacteriology: Mike Brodwater

CITY OF PLUMMER
BOX B
PLUMMER, ID 83851

Tracking Number: 11097-1010/
(Please Refer to this Tracking Number on any communications)

Storet:	
NPDES Number:	
Matrix:	WATER
Sample Location:	WW IRRIGATION FIELD
Type of Sample:	Wastewater, Chlorinated, Grab
Sample Taken From:	Lagoon - G
Collected by:	BOOTH
Preservation:	Sodium Thiosulfate

Date Collected: 10/08/97 Date Received in Lab: 10/08/97
Time Collected: 09:15 Time Received in Lab: 10:25

TEST CODE		RESULTS	COMPLETED
BDFC	FECAL COLIFORM (STORET # 31616)	30 /100 ML.	10/09/97

NOTES:

CHLORINATED EFFLUENT SAMPLES REQUIRE A SPECIAL MEDIA WITH A SHORT SHELF LIFE. PLEASE CONTACT THE LAB (769-1432) A DAY OR TWO BEFORE SUBMITTING CHLORINATED EFFLUENT SAMPLES TO GIVE US TIME TO PREPARE THE MEDIA.

Sewer Test - 2000

State of Idaho, Department of Health and Welfare
Bureau of Laboratories - Coeur d'Alene Branch Lab
2195 Ironwood Court, Coeur d'Alene, Idaho 83814
NON DRINKING WATER - BACTERIAL DENSITY REPORT

LAB: COEUR D'ALENE, Phone: (208) 769-1432
Branch Laboratory Supervisor, Bacteriology: Mike Brodwater

CITY OF PLUMMER
BOX B
PLUMMER, ID 83851

Tracking Number: 10600-9247/
(Please Refer to this Tracking Number on any communications)

Storet:	
NPDES Number:	0022781
Matrix:	WATER
Sample Location:	WW IRRIGATION FIELD
Type of Sample:	Wastewater, Chlorinated, Grab
Sample Taken From:	Lagoon - G
Collected by:	BOOTH
Preservation:	Sodium Thiosulfate

Date Collected: 06/28/00 Date Received in Lab: 06/28/00
Time Collected: 13:10 Time Received in Lab: 14:13

TEST CODE		RESULTS	COMPLETED
EMPE	FECAL COLIFORM	<2 /100 ML	07/01/00

Sewer Tests - 2000

State of Idaho, Department of Health and Welfare
Bureau of Laboratories - Coeur d'Alene Branch Lab
2195 Ironwood Court, Coeur d'Alene, Idaho 83814

WATER QUALITY REPORT - CHEMICAL REPORT

LAB: COEUR D'ALENE, Phone: (208) 769-1432
Branch Laboratory Supervisor: Mike Brodwater
Inorganic Chemistry Section: Peggy Albertson PA

CITY OF PLUMMER
CORKY BOOTH
P.O. BOX B
PLUMMER, ID 83851

Tracking Number: 10600-1079/
(Please Refer to this Tracking Number on any communications)

Survey Name:
Storet:
NPDES No.: 0022781
Sample Location: WW IRRIGATION FIELD
Submitted by: BOOTH
Purpose:
Taken From: Unknown - U
Type of Sample:
Composite: No
Preservation: Cooled 4° C

Date Collected: 06/28/00 Date Received in Lab: 06/28/00
Time Collected: 13:15

STORET	TEST PERFORMED	RESULTS	COMPLETED	ANST
00310	BOD-5	10 (mg/l)	07/04/00	DN
00154	Non-filterable Residue (110° C)	47 (mg/l)	07/03/00	DN

Sewer Tests - 20

State of Idaho, Department of Health and Welfare
Bureau of Laboratories - Coeur d'Alene Branch Lab
2195 Ironwood Court, Coeur d'Alene, Idaho 83814
NON DRINKING WATER - BACTERIAL DENSITY REPORT

LAB: COEUR D'ALENE, Phone: (208) 769-1432
Branch Laboratory Supervisor, Bacteriology: Mike Brodwater

CITY OF PLUMMER
BOX B
PLUMMER, ID 83851

Tracking Number: 10700-9431/
(Please Refer to this Tracking Number on any communications)

Storet:	
NPDES Number:	
Matrix:	WATER
Sample Location:	WW IRRIGATION FIELD
Type of Sample:	Wastewater, Chlorinated, Grab
Sample Taken From:	Lagoon - G
Collected by:	BOOTH
Preservation:	Sodium Thiosulfate

Date Collected: 07/07/00 Date Received in Lab: 07/07/00
Time Collected: 13:00 Time Received in Lab: 13:56

TEST CODE		RESULTS	COMPLETED
EMPN	TOTAL COLIFORM	<2 /100 ML	07/10/00

State of Idaho, Department of Health and Welfare
Bureau of Laboratories - Coeur d'Alene Branch Lab
2195 Ironwood Court, Coeur d'Alene, Idaho 83814
WATER QUALITY REPORT - CHEMICAL REPORT

LAB: COEUR D'ALENE, Phone: (208) 769-1432
Branch Laboratory Supervisor: Mike Brodwater
Inorganic Chemistry Section: Peggy Albertson PA

CITY OF PLUMMER
CORKY BOOTH
P.O. BOX B
PLUMMER, ID 83851

Tracking Number: 10700-1259/
(Please Refer to this Tracking Number on any communications)

Survey Name:
Storet:
NPDES No.: 0022781
Sample Location: WW IRRIGATION FIELD
Submitted by: BOOTH
Purpose:
Taken From: Lagoon - G
Type of Sample:
Composite: No
Preservation: Cooled 4° C

Date Collected: 07/19/00 Date Received in Lab: 07/19/00
Time Collected: 09:15

STORET	TEST PERFORMED	RESULTS	COMPLETED	ANST
00310	BOD-5	20 (mg/l)	07/25/00	DN
00154	Non-filterable Residue (110° C)	62 (mg/l)	07/25/00	DN

NOTES:

Please contact the laboratory prior to submitting future BOD-5s to insure that there will be sufficient supplies for your sample to be analyzed. (208)666-6718. Thank you.

Sewer tests 2000

State of Idaho, Department of Health and Welfare
Bureau of Laboratories - Coeur d'Alene Branch Lab
2195 Ironwood Court, Coeur d'Alene, Idaho 83814
NON DRINKING WATER - BACTERIAL DENSITY REPORT

LAB: COEUR D'ALENE, Phone: (208) 769-1432
Branch Laboratory Supervisor, Bacteriology: Mike Brodwater

CITY OF PLUMMER
BOX B
PLUMMER, ID 83851

Tracking Number: 10700-9689/
(Please Refer to this Tracking Number on any communications)

Storet:
NPDES Number: 0072781
Matrix: WATER
Sample Location: WW IRRIGATION FIELD
Type of Sample: Wastewater, Chlorinated, Grab
Sample Taken From: Lagoon - G
Collected by: BOOTH
Preservation: Sodium Thiosulfate

Date Collected: 07/19/00 Date Received in Lab: 07/19/00
Time Collected: 09:20 Time Received in Lab: 11:07

TEST CODE		RESULTS	COMPLETED
EMPN	TOTAL COLIFORM	>1600 /100 ML	07/22/00
EMPE	FECAL COLIFORM	4 /100 ML	07/22/00

State of Idaho, Department of Health and Welfare
Bureau of Laboratories - Coeur d'Alene Branch Lab
2195 Ironwood Court, Coeur d'Alene, Idaho 83814
NON DRINKING WATER - BACTERIAL DENSITY REPORT

LAB: COEUR D'ALENE, Phone: (208) 769-1432
Branch Laboratory Supervisor, Bacteriology: Mike Brodwater

CITY OF PLUMMER
BOX B
PLUMMER, ID 83851

Tracking Number: 10700-9831/
(Please Refer to this Tracking Number on any communications)

Storet:
NPDES Number:
Matrix: WATER
Sample Location: WW IRRIGATION FIELD
Type of Sample: Wastewater, Chlorinated, Grab
Sample Taken From: Lagoon - G
Collected by: BOOTH
Preservation: Sodium Thiosulfate AND Cooled, 4° C

Date Collected: 07/26/00 Date Received in Lab: 07/26/00
Time Collected: 07:50 Time Received in Lab: 08:59

TEST CODE		RESULTS	COMPLETED
EMPN	TOTAL COLIFORM	2 /100 ML	07/29/00

State of Idaho, Department of Health and Welfare
Bureau of Laboratories - Coeur d'Alene Branch Lab
2195 Ironwood Court, Coeur d'Alene, Idaho 83814
NON DRINKING WATER - BACTERIAL DENSITY REPORT

LAB: COEUR D'ALENE, Phone: (208) 769-1432
Branch Laboratory Supervisor, Bacteriology: Mike Brodwater

CITY OF PLUMMER
BOX B
PLUMMER, ID 83851

Tracking Number: 10800-9996/
(Please Refer to this Tracking Number on any communications)

Storet:	
NPDES Number:	0022781
Matrix:	WATER
Sample Location:	WW IRRIGATION FIELD
Type of Sample:	Wastewater, Chlorinated, Grab
Sample Taken From:	Lagoon - G
Collected by:	BOOTH
Preservation:	Sodium Thiosulfate

Date Collected: 08/02/00 Date Received in Lab: 08/02/00
Time Collected: 09:00 Time Received in Lab: 10:14

TEST CODE		RESULTS	COMPLETED
EMPN	TOTAL COLIFORM	>1,600 /100 ML	08/04/00

State of Idaho, Department of Health and Welfare
Bureau of Laboratories - Coeur d'Alene Branch Lab
2195 Ironwood Court, Coeur d'Alene, Idaho 83814
NON DRINKING WATER - BACTERIAL DENSITY REPORT

LAB: COEUR D'ALENE, Phone: (208) 769-1432
Branch Laboratory Supervisor, Bacteriology: Mike Brodwater

CITY OF PLUMMER
BOX B
PLUMMER, ID 83851

Tracking Number: 10800-0178/
(Please Refer to this Tracking Number on any communications)

Storet:
NPDES Number: 0022781
Matrix: WATER
Sample Location: WW IRRIGATION FIELD
Type of Sample: Wastewater, Chlorinated, Grab
Sample Taken From: Lagoon - G
Collected by: BOOTH
Preservation: Sodium Thiosulfate

Date Collected: 08/09/00 Date Received in Lab: 08/09/00
Time Collected: 08:35 Time Received in Lab: 10:46

TEST CODE		RESULTS	COMPLETED
EMPN	TOTAL COLIFORM	>1,600 /100 ML	08/11/00
EMPE	FECAL COLIFORM	900 /100 ML	08/11/00

NOTES:

LAB ID #ID00001

State of Idaho, Department of Health and Welfare
Bureau of Laboratories - Coeur d'Alene Branch Lab
2195 Ironwood Court, Coeur d'Alene, Idaho 83814
NON DRINKING WATER - BACTERIAL DENSITY REPORT

LAB: COEUR D'ALENE, Phone: (208) 769-1432
Branch Laboratory Supervisor, Bacteriology: Mike Brodwater

CITY OF PLUMMER
BOX B
PLUMMER, ID 83851

Tracking Number: 10800-0344/
(Please Refer to this Tracking Number on any communications)

Storet:	
NPDES Number:	0022781
Matrix:	WATER
Sample Location:	WW IRRIGATION FIELD
Type of Sample:	Wastewater, Chlorinated, Grab
Sample Taken From:	Lagoon - G
Collected by:	BOOTH
Preservation:	Sodium Thiosulfate AND Cooled, 4° C

Date Collected: 08/16/00 Date Received in Lab: 08/16/00
Time Collected: 09:15 Time Received in Lab: 10:16

TEST CODE		RESULTS	COMPLETED
EMPN	TOTAL COLIFORM	>1,600 /100 ML	08/18/00

NOTES:

LAB ID #ID00001

State of Idaho, Department of Health and Welfare
Bureau of Laboratories - Coeur d'Alene Branch Lab
2195 Ironwood Court, Coeur d'Alene, Idaho 83814
NON DRINKING WATER - BACTERIAL DENSITY REPORT

LAB: COEUR D'ALENE, Phone: (208) 769-1432
Branch Laboratory Supervisor, Bacteriology: Mike Brodwater

CITY OF PLUMMER
BOX B
PLUMMER, ID 83851

Tracking Number: 10800-0557/
(Please Refer to this Tracking Number on any communications)

Storet:
NPDES Number: 0022781
Matrix: WATER
Sample Location: WW IRRIGATION FIELD
Type of Sample: Wastewater, Chlorinated, Grab
Sample Taken From: Lagoon - G
Collected by: BOOTH
Preservation: Sodium Thiosulfate AND Cooled, 4° C

Date Collected: 08/23/00 Date Received in Lab: 08/23/00
Time Collected: 08:55 Time Received in Lab: 10:01

TEST CODE		RESULTS	COMPLETED
EMPN	TOTAL COLIFORM	300 /100 ML	08/26/00

NOTES:

LAB ID #ID00001

SKINNER #545. 2007

State of Idaho, Department of Health and Welfare
Bureau of Laboratories - Coeur d'Alene Branch Lab
2195 Ironwood Court, Coeur d'Alene, Idaho 83814
NON DRINKING WATER - BACTERIAL DENSITY REPORT

LAB: COEUR D'ALENE, Phone: (208) 769-1432
Branch Laboratory Supervisor, Bacteriology: Mike Brodwater

CITY OF PLUMMER
BOX B
PLUMMER, ID 83851

Tracking Number: 10800-0701/
(Please Refer to this Tracking Number on any communications)

Storet:
NPDES Number: 0022781
Matrix: WATER
Sample Location: WW IRRIGATION FIELD
Type of Sample: Wastewater, Chlorinated, Grab
Sample Taken From: Lagoon - G
Collected by: BOOTH
Preservation: Sodium Thiosulfate

Date Collected: 08/30/00 Date Received in Lab: 08/30/00
Time Collected: 08:30 Time Received in Lab: 09:33

TEST CODE		RESULTS	COMPLETED
EMPN	TOTAL COLIFORM	>1,600 /100 ML	09/01/00

NOTES:

LAB ID #ID00001

State of Idaho, Department of Health and Welfare
Bureau of Laboratories - Coeur d'Alene Branch Lab
2195 Ironwood Court, Coeur d'Alene, Idaho 83814
NON DRINKING WATER - BACTERIAL DENSITY REPORT

LAB: COEUR D'ALENE, Phone: (208) 769-1432
Branch Laboratory Supervisor, Bacteriology: Mike Brodwater

CITY OF PLUMMER
BOX B
PLUMMER, ID 83851

Tracking Number: 10900-0845/
(Please Refer to this Tracking Number on any communications)

Storet:	
NPDES Number:	0022781
Matrix:	WATER
Sample Location:	WW IRRIGATION FIELD
Type of Sample:	Wastewater, Chlorinated, Grab
Sample Taken From:	Lagoon - G
Collected by:	BOOTH
Preservation:	Sodium Thiosulfate AND Cooled, 4° C

Date Collected: 09/06/00
Time Collected: 08:05

Date Received in Lab: 09/06/00
Time Received in Lab: 09:40

TEST CODE		RESULTS	COMPLETED
EMPN	TOTAL COLIFORM	7 /100 ML	09/10/00
EMPE	FECAL COLIFORM	<2 /100 ML	09/10/00

NOTES:

LAB ID #ID00001

State of Idaho, Department of Health and Welfare
Bureau of Laboratories - Coeur d'Alene Branch Lab
2195 Ironwood Court, Coeur d'Alene, Idaho 83814

WATER QUALITY REPORT - CHEMICAL REPORT

LAB: COEUR D'ALENE, Phone: (208) 769-1432
Branch Laboratory Supervisor: Mike Brodwater
Inorganic Chemistry Section: Peggy Albertson PA

CITY OF PLUMMER
CORKY BOOTH
P.O. BOX B
PLUMMER, ID 83851

Tracking Number: 10900-1838/
(Please Refer to this Tracking Number on any communications)

Survey Name:
Storet:
NPDES No.: 0022781
Sample Location: W/W IRRIGATION FIELD
Submitted by: BOOTH
Purpose:
Taken From: Lagoon - G
Type of Sample:
Composite: No
Preservation: Cooled 4° C

Date Collected: 09/06/00 Date Received in Lab: 09/06/00
Time Collected: 08:05

STORET	TEST PERFORMED	RESULTS	COMPLETED	ANST
00310	BOD-5	32 (mg/l)	09/12/00	DN
00154	Non-filterable Residue (110° C)	86 (mg/l)	09/12/00	DN

State of Idaho, Department of Health and Welfare
Bureau of Laboratories - Coeur d'Alene Branch Lab
2195 Ironwood Court, Coeur d'Alene, Idaho 83814
NON DRINKING WATER - BACTERIAL DENSITY REPORT

LAB: COEUR D'ALENE, Phone: (208) 769-1432
Branch Laboratory Supervisor, Bacteriology: Mike Brodwater

CITY OF PLUMMER
BOX B
PLUMMER, ID 83851

Tracking Number: 11000-1877/
(Please Refer to this Tracking Number on any communications)

Storet:	
NPDES Number:	0022701
Matrix:	WATER
Sample Location:	IRRIGATION FIELD
Type of Sample:	Wastewater, Chlorinated, Grab
Sample Taken From:	Lagoon - G
Collected by:	SCHULTZ
Preservation:	Sodium Thiosulfate

Date Collected: 10/19/00 Date Received in Lab: 10/19/00
Time Collected: 09:00 Time Received in Lab: 09:58

TEST CODE		RESULTS	COMPLETED
EMPN	TOTAL COLIFORM	300 /100 ML	10/22/00

NOTES:

LAB ID #ID00001

State of Idaho, Department of Health and Welfare
Bureau of Laboratories - Coeur d'Alene Branch Lab
2195 Ironwood Court, Coeur d'Alene, Idaho 83814
NON DRINKING WATER - BACTERIAL DENSITY REPORT

LAB: COEUR D'ALENE, Phone: (208) 769-1432
Branch Laboratory Supervisor, Bacteriology: Mike Brodwater

CITY OF PLUMMER
BOX B
PLUMMER, ID 83851

Tracking Number: 11000-1984/
(Please Refer to this Tracking Number on any communications)

Storet:	
NPDES Number:	0022701
Matrix:	WATER
Sample Location:	IRRIGATION FIELD
Type of Sample:	Wastewater, Chlorinated, Grab
Sample Taken From:	Lagoon - G
Collected by:	SCHULZ
Preservation:	Sodium Thiosulfate AND Cooled, 4° C

Date Collected: 10/25/00 Date Received in Lab: 10/25/00
Time Collected: 09:00 Time Received in Lab: 10:09

TEST CODE		RESULTS	COMPLETED
EMPN	TOTAL COLIFORM	500 /100 ML	10/30/00

NOTES:

LAB ID #ID00001

State of Idaho, Department of Health and Welfare
Bureau of Laboratories - Coeur d'Alene Branch Lab
2195 Ironwood Court, Coeur d'Alene, Idaho 83814

WATER QUALITY REPORT - CHEMICAL REPORT

LAB: COEUR D'ALENE, Phone: (208) 769-1432
Branch Laboratory Supervisor: Mike Brodwater
Inorganic Chemistry Section: Peggy Albertson

CITY OF PLUMMER
CORKY BOOTH
P.O. BOX B
PLUMMER, ID 83851

Tracking Number: 11000-2386/
(Please Refer to this Tracking Number on any communications)

Survey Name:
Storet:
NPDES No.:
Sample Location: WW IRRIGATION FIELD
Submitted by: SCHULZ
Purpose:
Taken From: Sewage Treatment Plant - P
Type of Sample:
Composite: No
Preservation: Cooled 4° C

Date Collected: 10/25/00 Date Received in Lab: 10/25/00
Time Collected:

STORET	TEST PERFORMED	RESULTS	COMPLETED	ANST
00310	BOD-5	18 (mg/l)	10/31/00	DN
00530	Non-filterable Residue (105° C)	49 (mg/l)	10/27/00	DN

State of Idaho, Department of Health and Welfare
Bureau of Laboratories - Coeur d'Alene Branch Lab
2195 Ironwood Court, Coeur d'Alene, Idaho 83814
NON DRINKING WATER - BACTERIAL DENSITY REPORT

LAB: COEUR D'ALENE, Phone: (208) 769-1432
Branch Laboratory Supervisor, Bacteriology: Mike Brodwater

CITY OF PLUMMER
BOX B
PLUMMER, ID 83851

Tracking Number: 11000-2114/
(Please Refer to this Tracking Number on any communications)

Storet:	
NPDES Number:	0022781
Matrix:	WATER
Sample Location:	IRRIGATION FIELD
Type of Sample:	Wastewater, Chlorinated, Grab
Sample Taken From:	Lagoon - G
Collected by:	BOOTH
Preservation:	Sodium Thiosulfate AND Cooled, 4° C

Date Collected: 10/31/00
Time Collected: 09:25

Date Received in Lab: 10/31/00
Time Received in Lab: 11:13

TEST CODE		RESULTS	COMPLETED
EMPN	TOTAL COLIFORM	4 /100 ML	11/03/00
EMPE	FECAL COLIFORM	<2 /100 ML	11/03/00

NOTES:

LAB ID #ID00001

State of Idaho, Department of Health and Welfare
Bureau of Laboratories - Coeur d'Alene Branch Lab
2195 Ironwood Court, Coeur d'Alene, Idaho 83814
NON DRINKING WATER - BACTERIAL DENSITY REPORT

LAB: COEUR D'ALENE, Phone: (208) 769-1432
Branch Laboratory Supervisor, Bacteriology: Mike Brodwater

CITY OF PLUMMER
BOX B
PLUMMER, ID 83851

Tracking Number: 10601-5671/
(Please Refer to this Tracking Number on any communications)

Storet:
NPDES Number:
Matrix: WATER
Sample Location: WWTP IRRIGATION FIELD
Type of Sample: Wastewater, Chlorinated, Grab
Sample Taken From: Lagoon - G
Collected by: BOOTH
Preservation: Sodium Thiosulfate

Date Collected: 06/06/01
Time Collected: 08:20
Date Received in Lab: 06/06/01
Time Received in Lab: 09:59

TEST CODE		RESULTS	COMPLETED
EMPE	FECAL COLIFORM	300 /100 ML	06/09/01

NOTES:

LAB ID #ID00001

State of Idaho, Department of Health and Welfare
Bureau of Laboratories - Coeur d'Alene Branch Lab
2195 Ironwood Court, Coeur d'Alene, Idaho 83814
NON DRINKING WATER - BACTERIAL DENSITY REPORT

LAB: COEUR D'ALENE, Phone: (208) 769-1432
Branch Laboratory Supervisor, Bacteriology: Mike Brodwater

CITY OF PLUMMER
BOX B
PLUMMER, ID 83851

Tracking Number: 10601-5671/
(Please Refer to this Tracking Number on any communications)

Storet:
NPDES Number:
Matrix: WATER
Sample Location: WWTP IRRIGATION FIELD
Type of Sample: Wastewater, Chlorinated, Grab
Sample Taken From: Lagoon - G
Collected by: BOOTH
Preservation: Sodium Thiosulfate

Date Collected: 06/06/01
Time Collected: 08:20

Date Received in Lab: 06/06/01
Time Received in Lab: 09:59

TEST CODE		RESULTS	COMPLETED
EMPE	FECAL COLIFORM	300 /100 ML	06/09/01

NOTES:

LAB ID #ID00001

State of Idaho, Department of Health and Welfare
Bureau of Laboratories - Coeur d'Alene Branch Lab
2195 Ironwood Court, Coeur d'Alene, Idaho 83814
NON DRINKING WATER - BACTERIAL DENSITY REPORT

LAB: COEUR D'ALENE, Phone: (208) 769-1432
Branch Laboratory Supervisor, Bacteriology: Mike Brodwater

CITY OF PLUMMER
BOX B
PLUMMER, ID 83851

Tracking Number: 10601-5785/
(Please Refer to this Tracking Number on any communications)

Storet:
NPDES Number:
Matrix: WATER
Sample Location: WASTEWATER IRRIGATION FIELD
Type of Sample: Wastewater, Chlorinated, Grab
Sample Taken From: Lagoon - G
Collected by: HUBER
Preservation: Sodium Thiosulfate

Date Collected: 06/13/01
Time Collected: 07:49

Date Received in Lab: 06/13/01
Time Received in Lab: 08:56

TEST CODE		RESULTS	COMPLETED
EMPE	FECAL COLIFORM	30 /100 ML	06/16/01

NOTES:

LAB ID #ID00001

State of Idaho, Department of Health and Welfare
Bureau of Laboratories - Coeur d'Alene Branch Lab
2195 Ironwood Court, Coeur d'Alene, Idaho 83814
NON DRINKING WATER - BACTERIAL DENSITY REPORT

LAB: COEUR D'ALENE, Phone: (208) 769-1432
Branch Laboratory Supervisor, Bacteriology: Mike Brodwater

CITY OF PLUMMER
BOX B
PLUMMER, ID 83851

Tracking Number: 10601-5785/
(Please Refer to this Tracking Number on any communications)

Storet:
NPDES Number:
Matrix: WATER
Sample Location: WASTEWATER IRRIGATION FIELD
Type of Sample: Wastewater, Chlorinated, Grab
Sample Taken From: Lagoon - G
Collected by: HUBER
Preservation: Sodium Thiosulfate

Date Collected: 06/13/01
Time Collected: 07:49

Date Received in Lab: 06/13/01
Time Received in Lab: 08:56

TEST CODE		RESULTS	COMPLETED
EMPE	FECAL COLIFORM	30 /100 ML	06/16/01

NOTES:

LAB ID #ID00001

State of Idaho, Department of Health and Welfare
Bureau of Laboratories - Coeur d'Alene Branch Lab
2195 Ironwood Court, Coeur d'Alene, Idaho 83814
NON DRINKING WATER - BACTERIAL DENSITY REPORT

LAB: COEUR D'ALENE, Phone: (208) 769-1432
Branch Laboratory Supervisor, Bacteriology: Mike Brodwater

CITY OF PLUMMER
BOX B
PLUMMER, ID 83851

Tracking Number: 10601-5941/
(Please Refer to this Tracking Number on any communications)

Storet:
NPDES Number:
Matrix: WATER
Sample Location: PLUMMER LAGOON
Type of Sample: Wastewater, Chlorinated, Grab
Sample Taken From: Lagoon - G
Collected by: JANSON
Preservation: Sodium Thiosulfate

Date Collected: 06/20/01
Time Collected: 07:30

Date Received in Lab: 06/20/01
Time Received in Lab: 09:44

TEST CODE		RESULTS	COMPLETED
EMPE	FECAL COLIFORM	80 /100 ML	06/23/01

NOTES:

LAB ID #ID00001

State of Idaho, Department of Health and Welfare
Bureau of Laboratories - Coeur d'Alene Branch Lab
2195 Ironwood Court, Coeur d'Alene, Idaho 83814
NON DRINKING WATER - BACTERIAL DENSITY REPORT

LAB: COEUR D'ALENE, Phone: (208) 769-1432
Branch Laboratory Supervisor, Bacteriology: Mike Brodwater

CITY OF PLUMMER
BOX B
PLUMMER, ID 83851

Tracking Number: 10601-5941/
(Please Refer to this Tracking Number on any communications)

Storet:
NPDES Number:
Matrix: WATER
Sample Location: PLUMMER LAGOON
Type of Sample: Wastewater, Chlorinated, Grab
Sample Taken From: Lagoon - G
Collected by: JANSON
Preservation: Sodium Thiosulfate

Date Collected: 06/20/01 Date Received in Lab: 06/20/01
Time Collected: 07:30 Time Received in Lab: 09:44

TEST CODE		RESULTS	COMPLETED
EMPE	FECAL COLIFORM	80 /100 ML	06/23/01

NOTES:

LAB ID #ID00001

State of Idaho, Department of Health and Welfare
Bureau of Laboratories - Coeur d'Alene Branch Lab
2195 Ironwood Court, Coeur d'Alene, Idaho 83814
NON DRINKING WATER - BACTERIAL DENSITY REPORT

LAB: COEUR D'ALENE, Phone: (208) 769-1432
Branch Laboratory Supervisor, Bacteriology: Mike Brodwater

CITY OF PLUMMER
BOX B
PLUMMER, ID 83851

Tracking Number: 10601-6110/
(Please Refer to this Tracking Number on any communications)

Storet:
NPDES Number:
Matrix: WATER
Sample Location: WW IRRIGATION FIELD
Type of Sample: Wastewater, Final, Chlorinated, Grab
Sample Taken From: Lagoon - G
Collected by: BOOTH
Preservation: Sodium Thiosulfate

Date Collected: 06/27/01
Time Collected: 07:30

Date Received in Lab: 06/27/01
Time Received in Lab: 10:18

TEST CODE		RESULTS	COMPLETED
EMPE	FECAL COLIFORM	900 /100 ML	06/30/01

NOTES:

LAB ID #ID00001

State of Idaho, Department of Health and Welfare
Bureau of Laboratories - Coeur d'Alene Branch Lab
2195 Ironwood Court, Coeur d'Alene, Idaho 83814
NON DRINKING WATER - BACTERIAL DENSITY REPORT

LAB: COEUR D'ALENE, Phone: (208) 769-1432
Branch Laboratory Supervisor, Bacteriology: Mike Brodwater

CITY OF PLUMMER
BOX B
PLUMMER, ID 83851

Tracking Number: 10601-6110/
(Please Refer to this Tracking Number on any communications)

Storet:
NPDES Number:
Matrix: WATER
Sample Location: WW IRRIGATION FIELD
Type of Sample: Wastewater, Final, Chlorinated, Grab
Sample Taken From: Lagoon - G
Collected by: BOOTH
Preservation: Sodium Thiosulfate

Date Collected: 06/27/01
Time Collected: 07:30

Date Received in Lab: 06/27/01
Time Received in Lab: 10:18

TEST CODE		RESULTS	COMPLETED
EMPE	FECAL COLIFORM	900 /100 ML	06/30/01

NOTES:

LAB ID #ID00001

State of Idaho, Department of Health and Welfare
Bureau of Laboratories - Coeur d'Alene Branch Lab
2195 Ironwood Court, Coeur d'Alene, Idaho 83814

WATER QUALITY REPORT - CHEMICAL REPORT

LAB: COEUR D'ALENE, Phone: (208) 769-1432
Branch Laboratory Supervisor: Mike Brodwater
Inorganic Chemistry Section: Peggy Albertson

CITY OF PLUMMER
CORKY BOOTH
P.O. BOX B
PLUMMER, ID 83851

Tracking Number: 10601-0777/
(Please Refer to this Tracking Number on any communications)

Survey Name:
Storet:
NPDES No.: 002278-1
Sample Location: WW IRRIGATION FIELD
Submitted by: BOOTH
Purpose:
Taken From: Sewage Treatment Plant - P
Type of Sample:
Composite: No
Preservation: Cooled 4° C

Date Collected: 06/27/01 Date Received in Lab: 06/27/01
Time Collected: 07:45

STORET	TEST PERFORMED	RESULTS	COMPLETED	ANST
00310	BOD-5	16 (mg/l)	07/03/01	PH
00530	Non-filterable Residue (105° C)	26 (mg/l)	07/03/01	PH

State of Idaho, Department of Health and Welfare
Bureau of Laboratories - Coeur d'Alene Branch Lab
2195 Ironwood Court, Coeur d'Alene, Idaho 83814

WATER QUALITY REPORT - CHEMICAL REPORT

LAB: COEUR D'ALENE, Phone: (208) 769-1432
Branch Laboratory Supervisor: Mike Brodwater
Inorganic Chemistry Section: Peggy Albertson

CITY OF PLUMMER
CORKY BOOTH
P.O. BOX B
PLUMMER, ID 83851

Tracking Number: 10601-0777/
(Please Refer to this Tracking Number on any communications)

Survey Name:
Storet:
NPDES No.: 002278-1
Sample Location: WW IRRIGATION FIELD
Submitted by: BOOTH
Purpose:
Taken From: Sewage Treatment Plant - P
Type of Sample:
Composite: No
Preservation: Cooled 4° C

Date Collected: 06/27/01   Date Received in Lab: 06/27/01
Time Collected: 07:45

STORET	TEST PERFORMED	RESULTS	COMPLETED	ANST
00310	BOD-5	16 (mg/l)	07/03/01	PH
00530	Non-filterable Residue (105° C)	26 (mg/l)	07/03/01	PH

State of Idaho, Department of Health and Welfare
Bureau of Laboratories - Coeur d'Alene Branch Lab
2195 Ironwood Court, Coeur d'Alene, Idaho 83814
NON DRINKING WATER - BACTERIAL DENSITY REPORT

LAB: COEUR D'ALENE, Phone: (208) 769-1432
Branch Laboratory Supervisor, Bacteriology: Mike Brodwater

CITY OF PLUMMER
BOX B
PLUMMER, ID 83851

Tracking Number: 10701-6242/
(Please Refer to this Tracking Number on any communications)

Storet:
NPDES Number:
Matrix: WATER
Sample Location: WW IRRIGATION FIELD
Type of Sample: Wastewater, Chlorinated, Grab
Sample Taken From: Lagoon - G
Collected by: HUBER
Preservation: Sodium Thiosulfate AND Cooled, 4° C

Date Collected: 07/03/01
Time Collected: 08:05
Date Received in Lab: 07/03/01
Time Received in Lab: 08:53

TEST CODE		RESULTS	COMPLETED
EMPN	TOTAL COLIFORM	>1,600 /100 ML	07/06/01

NOTES:

LAB ID #ID00001

State of Idaho, Department of Health and Welfare
Bureau of Laboratories - Coeur d'Alene Branch Lab
2195 Ironwood Court, Coeur d'Alene, Idaho 83814
NON DRINKING WATER - BACTERIAL DENSITY REPORT

LAB: COEUR D'ALENE, Phone: (208) 769-1432
Branch Laboratory Supervisor, Bacteriology: Mike Brodwater

CITY OF PLUMMER
BOX B
PLUMMER, ID 83851

Tracking Number: 10701-6454/
(Please Refer to this Tracking Number on any communications)

Storet:
NPDES Number:
Matrix: WATER
Sample Location: WW IRRIGATION FIELD
Type of Sample: Wastewater, Chlorinated, Grab
Sample Taken From: Lagoon - G
Collected by: HUBER
Preservation: Sodium Thiosulfate AND Cooled, 4° C

Date Collected: 07/11/01 Date Received in Lab: 07/11/01
Time Collected: 06:42 Time Received in Lab: 09:57

TEST CODE		RESULTS	COMPLETED
EMPN	TOTAL COLIFORM	>1,600 /100 ML	07/13/01

NOTES:

LAB ID #ID00001

State of Idaho, Department of Health and Welfare
Bureau of Laboratories - Coeur d'Alene Branch Lab
2195 Ironwood Court, Coeur d'Alene, Idaho 83814
NON DRINKING WATER - BACTERIAL DENSITY REPORT

LAB: COEUR D'ALENE, Phone: (208) 769-1432
Branch Laboratory Supervisor, Bacteriology: Mike Brodwater

CITY OF PLUMMER
BOX B
PLUMMER, ID 83851

Tracking Number: 10701-6660/
(Please Refer to this Tracking Number on any communications)

Storet:
NPDES Number:
Matrix: WATER
Sample Location: WW IRRIGATION FIELD
Type of Sample: Wastewater, Chlorinated, Grab
Sample Taken From: Lagoon - G
Collected by: JANSON
Preservation: Sodium Thiosulfate

Date Collected: 07/18/01
Time Collected: 08:35

Date Received in Lab: 07/18/01
Time Received in Lab: 10:02

TEST CODE		RESULTS	COMPLETED
EMPN	TOTAL COLIFORM	220 /100 ML	07/21/01

NOTES:

LAB ID #ID00001

State of Idaho, Department of Health and Welfare
Bureau of Laboratories - Coeur d'Alene Branch Lab
2195 Ironwood Court, Coeur d'Alene, Idaho 83814
NON DRINKING WATER - BACTERIAL DENSITY REPORT

LAB: COEUR D'ALENE, Phone: (208) 769-1432
Branch Laboratory Supervisor, Bacteriology: Mike Brodwater

CITY OF PLUMMER
BOX B
PLUMMER, ID 83851

Tracking Number: 10701-6660/
(Please Refer to this Tracking Number on any communications)

Storet:	
NPDES Number:	
Matrix:	WATER
Sample Location:	WW IRRIGATION FIELD
Type of Sample:	Wastewater, Chlorinated, Grab
Sample Taken From:	Lagoon - G
Collected by:	JANSON
Preservation:	Sodium Thiosulfate

Date Collected: 07/18/01
Time Collected: 08:35

Date Received in Lab: 07/18/01
Time Received in Lab: 10:02

TEST CODE		RESULTS	COMPLETED
EMPN	TOTAL COLIFORM	220 /100 ML	07/21/01

NOTES:

LAB ID #ID00001

State of Idaho, Department of Health and Welfare
Bureau of Laboratories - Coeur d'Alene Branch Lab
2195 Ironwood Court, Coeur d'Alene, Idaho 83814
NON DRINKING WATER - BACTERIAL DENSITY REPORT

LAB: COEUR D'ALENE, Phone: (208) 769-1432
Branch Laboratory Supervisor, Bacteriology: Mike Brodwater

CITY OF PLUMMER
BOX B
PLUMMER, ID 83851

Tracking Number: 10701-6832/
(Please Refer to this Tracking Number on any communications)

Storet:	
NPDES Number:	
Matrix:	WATER
Sample Location:	WW IRRIGATION FIELD
Type of Sample:	Wastewater, Chlorinated, Grab
Sample Taken From:	Lagoon - G
Collected by:	HUBER
Preservation:	Sodium Thiosulfate AND Cooled, 4° C

Date Collected: 07/25/01 Date Received in Lab: 07/25/01
Time Collected: 07:54 Time Received in Lab: 09:49

TEST CODE		RESULTS	COMPLETED
EMPE	FECAL COLIFORM	50 /100 ML	07/28/01

NOTES:

LAB ID #ID00001

State of Idaho, Department of Health and Welfare
Bureau of Laboratories - Coeur d'Alene Branch Lab
2195 Ironwood Court, Coeur d'Alene, Idaho 83814

WATER QUALITY REPORT - CHEMICAL REPORT

LAB: COEUR D'ALENE, Phone: (208) 769-1432
Branch Laboratory Supervisor: Mike Brodwater
Inorganic Chemistry Section: Peggy Albertson

CITY OF PLUMMER
CORKY BOOTH
P.O. BOX B
PLUMMER, ID 83851

Tracking Number: 10701-0890/
(Please Refer to this Tracking Number on any communications)

Survey Name:
Storet:
NPDES No.: 0022781
Sample Location: WW IRRIGATION FIELD
Submitted by: BOOTH
Purpose:
Taken From: Lagoon - G
Type of Sample:
Composite: No
Preservation: Cooled 4° C

Date Collected: 07/25/01 Date Received in Lab: 07/25/01
Time Collected: 07:54

STORET	TEST PERFORMED	RESULTS	COMPLETED	ANST
00310	BOD-5	17 (mg/l)	07/31/01	PH
00530	Non-filterable Residue (105° C)	61 (mg/l)	07/31/01	PH

State of Idaho, Department of Health and Welfare
Bureau of Laboratories - Coeur d'Alene Branch Lab
2195 Ironwood Court, Coeur d'Alene, Idaho 83814
NON DRINKING WATER - BACTERIAL DENSITY REPORT

LAB: COEUR D'ALENE, Phone: (208) 769-1432
Branch Laboratory Supervisor, Bacteriology: Mike Brodwater

CITY OF PLUMMER
BOX B
PLUMMER, ID 83851

Tracking Number: 10801-7016/
(Please Refer to this Tracking Number on any communications)

Storet:
NPDES Number:
Matrix: WATER
Sample Location: WW IRRIGATION FIELD
Type of Sample: Wastewater, Chlorinated, Grab
Sample Taken From: Lagoon - G
Collected by: BOOTH
Preservation: Sodium Thiosulfate

Date Collected: 08/01/01
Time Collected: 08:45
Date Received in Lab: 08/01/01
Time Received in Lab: 09:53

TEST CODE		RESULTS	COMPLETED
EMPN	TOTAL COLIFORM	1,600 /100 ML	08/04/01

NOTES:

LAB ID #ID00001

State of Idaho, Department of Health and Welfare
Bureau of Laboratories - Coeur d'Alene Branch Lab
2195 Ironwood Court, Coeur d'Alene, Idaho 83814
NON DRINKING WATER - BACTERIAL DENSITY REPORT

LAB: COEUR D'ALENE, Phone: (208) 769-1432
Branch Laboratory Supervisor, Bacteriology: Mike Brodwater

CITY OF PLUMMER
BOX B
PLUMMER, ID 83851

Tracking Number: 10801-7228/
(Please Refer to this Tracking Number on any communications)

Storet:
NPDES Number:
Matrix: WATER
Sample Location: IRRIGATION FIELD
Type of Sample: Wastewater, Chlorinated, Grab
Sample Taken From: Lagoon - G
Collected by: BOOTH
Preservation: Sodium Thiosulfate

Date Collected: 08/08/01
Time Collected: 08:00

Date Received in Lab: 08/08/01
Time Received in Lab: 10:02

TEST CODE		RESULTS	COMPLETED
EMPE	FECAL COLIFORM	4 /100 ML	08/11/01

NOTES:

LAB ID #ID00001

State of Idaho, Department of Health and Welfare
Bureau of Laboratories - Coeur d'Alene Branch Lab
2195 Ironwood Court, Coeur d'Alene, Idaho 83814

WATER QUALITY REPORT - CHEMICAL REPORT

LAB: COEUR D'ALENE, Phone: (208) 769-1432
Branch Laboratory Supervisor: Mike Brodwater
Inorganic Chemistry Section: Peggy Albertson PA

CITY OF PLUMMER
CORKY BOOTH
P.O. BOX B
PLUMMER, ID 83851

Tracking Number: 10801-0949/
(Please Refer to this Tracking Number on any communications)

Survey Name:
Storet:
NPDES No.: 0022781
Sample Location: IRRIGATION FIELD
Submitted by: BOOTH
Purpose:
Taken From: Lagoon - G
Type of Sample:
Composite: No
Preservation: Cooled 4° C

Date Collected: 08/08/01 Date Received in Lab: 08/08/01
Time Collected:

STORET	TEST PERFORMED	RESULTS	COMPLETED	ANST
00310	BOD-5	28 (mg/l)	08/14/01	PH
00530	Non-filterable Residue (105° C)	76 (mg/l)	08/14/01	PH

State of Idaho, Department of Health and Welfare
Bureau of Laboratories - Coeur d'Alene Branch Lab
2195 Ironwood Court, Coeur d'Alene, Idaho 83814
NON DRINKING WATER - BACTERIAL DENSITY REPORT

LAB: COEUR D'ALENE, Phone: (208) 769-1432
Branch Laboratory Supervisor, Bacteriology: Mike Brodwater

CITY OF PLUMMER
BOX B
PLUMMER, ID 83851

Tracking Number: 10801-7429/
(Please Refer to this Tracking Number on any communications)

Storet:
NPDES Number:
Matrix: WATER
Sample Location: WW IRRIGATION FIELD
Type of Sample: Wastewater, Chlorinated, Grab
Sample Taken From: Lagoon - G
Collected by: BOOTH
Preservation: Sodium Thiosulfate

Date Collected: 08/16/01
Time Collected: 08:20

Date Received in Lab: 08/16/01
Time Received in Lab: 10:24

TEST CODE		RESULTS	COMPLETED
EMPN	TOTAL COLIFORM	80 /100 ML	08/19/01

NOTES:

LAB ID #ID00001

State of Idaho, Department of Health and Welfare
Bureau of Laboratories - Coeur d'Alene Branch Lab
2195 Ironwood Court, Coeur d'Alene, Idaho 83814
NON DRINKING WATER - BACTERIAL DENSITY REPORT

LAB: COEUR D'ALENE, Phone: (208) 769-1432
Branch Laboratory Supervisor, Bacteriology: Mike Brodwater

CITY OF PLUMMER
BOX B
PLUMMER, ID 83851

Tracking Number: 11001-8864/
(Please Refer to this Tracking Number on any communications)

Storet:
NPDES Number:
Matrix: WATER
Sample Location: PLUMMER IRRIGATION FIELD
Type of Sample: Wastewater, Chlorinated, Grab
Sample Taken From: Lagoon - G
Collected by: JANSON
Preservation: Sodium Thiosulfate AND Cooled, 4° C

Date Collected: 10/10/01
Time Collected: 08:55

Date Received in Lab: 10/10/01
Time Received in Lab: 10:17

TEST CODE		RESULTS	COMPLETED
EMPN	TOTAL COLIFORM	>1,600 /100 ML	10/13/01

NOTES:

LAB ID #ID00001

State of Idaho, Department of Health and Welfare
Bureau of Laboratories - Coeur d'Alene Branch Lab
2195 Ironwood Court, Coeur d'Alene, Idaho 83814
NON DRINKING WATER - BACTERIAL DENSITY REPORT

LAB: COEUR D'ALENE, Phone: (208) 769-1432
Branch Laboratory Supervisor, Bacteriology: Mike Brodwater

CITY OF PLUMMER
BOX B
PLUMMER, ID 83851

Tracking Number: 11001-9139/
(Please Refer to this Tracking Number on any communications)

Storet:
NPDES Number:
Matrix: WATER
Sample Location: LAGOON IRRIGATION FIELD
Type of Sample: Wastewater, Chlorinated, Grab
Sample Taken From: Lagoon - G
Collected by: JANSON
Preservation: Sodium Thiosulfate

Date Collected: 10/24/01
Time Collected: 09:30

Date Received in Lab: 10/24/01
Time Received in Lab: 10:38

TEST CODE		RESULTS	COMPLETED
EMPN	TOTAL COLIFORM	1,600 /100 ML	10/28/01

NOTES:

LAB ID #ID00001

State of Idaho, Department of Health and Welfare
Bureau of Laboratories - Coeur d'Alene Branch Lab
2195 Ironwood Court, Coeur d'Alene, Idaho 83814

WATER QUALITY REPORT - CHEMICAL REPORT

LAB: COEUR D'ALENE, Phone: (208) 769-1432
Branch Laboratory Supervisor: Mike Brodwater
Inorganic Chemistry Section: Peggy Albertson

CITY OF PLUMMER
CORKY BOOTH
P.O. BOX B
PLUMMER, ID 83851

Tracking Number: 11001-1727/
(Please Refer to this Tracking Number on any communications)

Survey Name:
Storet:
NPDES No.: 0022781
Sample Location: WW EFFLUENT
Submitted by: BOOTH
Purpose:
Taken From: Lagoon - G
Type of Sample:
Composite: No
Preservation: Cooled 4° C

Date Collected: 10/31/01 Date Received in Lab: 10/31/01
Time Collected: 07:30

STORET	TEST PERFORMED	RESULTS	COMPLETED	ANST
00310	BOD-5	10 (mg/l)	11/06/01	PH
00530	Non-filterable Residue (105° C)	52 (mg/l)	11/05/01	PH

State of Idaho, Department of Health and Welfare
Bureau of Laboratories - Coeur d'Alene Branch Lab
2195 Ironwood Court, Coeur d'Alene, Idaho 83814

WATER QUALITY REPORT - CHEMICAL REPORT

LAB: COEUR D'ALENE, Phone: (208) 769-1432
Branch Laboratory Supervisor: Mike Brodwater
Inorganic Chemistry Section: Peggy Albertson

CITY OF PLUMMER
CORKY BOOTH
P.O. BOX B
PLUMMER, ID 83851

Tracking Number: 11001-1727/
(Please Refer to this Tracking Number on any communications)

Survey Name:
Storet:
NPDES No.: 0022781
Sample Location: WW EFFLUENT
Submitted by: BOOTH
Purpose:
Taken From: Lagoon - G
Type of Sample:
Composite: No
Preservation: Cooled 4° C

Date Collected: 10/31/01
Time Collected: 07:30
Date Received in Lab: 10/31/01

STORET	TEST PERFORMED	RESULTS	COMPLETED	ANST
00310	BOD-5	10 (mg/l)	11/06/01	PH
00530	Non-filterable Residue (105° C)	52 (mg/l)	11/05/01	PH

State of Idaho, Department of Health and Welfare
Bureau of Laboratories - Coeur d'Alene Branch Lab
2195 Ironwood Court, Coeur d'Alene, Idaho 83814
WATER QUALITY REPORT - CHEMICAL REPORT

LAB: COEUR D'ALENE, Phone: (208) 769-1432
Branch Laboratory Supervisor: Mike Brodwater
Inorganic Chemistry Section: Peggy Albertson

CITY OF PLUMMER
CORKY BOOTH
P.O. BOX B
PLUMMER, ID 83851

Tracking Number: 11001-1727/
(Please Refer to this Tracking Number on any communications)

Survey Name:
Storet:
NPDES No.: 0022781
Sample Location: WW EFFLUENT
Submitted by: BOOTH
Purpose:
Taken From: Lagoon - G
Type of Sample:
Composite: No
Preservation: Cooled 4° C

Date Collected: 10/31/01 Date Received in Lab: 10/31/01
Time Collected: 07:30

STORET	TEST PERFORMED	RESULTS	COMPLETED	ANST
00310	BOD-5	10 (mg/l)	11/06/01	PH
00530	Non-filterable Residue (105° C)	52 (mg/l)	11/05/01	PH

State of Idaho, Department of Health and Welfare
Bureau of Laboratories - Coeur d'Alene Branch Lab
2195 Ironwood Court, Coeur d'Alene, Idaho 83814
NON DRINKING WATER - BACTERIAL DENSITY REPORT

LAB: COEUR D'ALENE, Phone: (208) 769-1432
Branch Laboratory Supervisor, Bacteriology: Mike Brodwater

CITY OF PLUMMER
BOX B
PLUMMER, ID 83851

Tracking Number: 11001-9285/
(Please Refer to this Tracking Number on any communications)

Storet:	
NPDES Number:	
Matrix:	WATER
Sample Location:	WW IRRIGATION FIELD
Type of Sample:	Wastewater, Chlorinated, Grab
Sample Taken From:	Lagoon - G
Collected by:	BOOTH
Preservation:	Sodium Thiosulfate

Date Collected: 10/31/01 Date Received in Lab: 10/31/01
Time Collected: 07:30 Time Received in Lab: 09:41

TEST CODE		RESULTS	COMPLETED
EMPN	TOTAL COLIFORM	>1,600 /100 ML	11/03/01

NOTES:

LAB ID #ID00001

State of Idaho, Department of Health and Welfare
Bureau of Laboratories - Coeur d'Alene Branch Lab
2195 Ironwood Court, Coeur d'Alene, Idaho 83814
NON DRINKING WATER - BACTERIAL DENSITY REPORT

LAB: COEUR D'ALENE, Phone: (208) 769-1432
Branch Laboratory Supervisor, Bacteriology: Mike Brodwater

CITY OF PLUMMER
BOX B
PLUMMER, ID 83851

Tracking Number: 10602-3289/
(Please Refer to this Tracking Number on any communications)

Storet:
NPDES Number:
Matrix: WATER
Sample Location: WW IRRIGATION FIELD
Type of Sample: Wastewater, Chlorinated, Grab
Sample Taken From: Sewage Treatment Plant - P
Collected by: JANSON
Preservation: Sodium Thiosulfate

Date Collected: 06/05/02
Time Collected: 09:00

Date Received in Lab: 06/05/02
Time Received in Lab: 10:43

TEST CODE		RESULTS	COMPLETED
EMPN	TOTAL COLIFORM	23 /100 ML	06/10/02
EMPE	FECAL COLIFORM	<2 /100 ML	06/10/02

NOTES:

LAB ID #ID00001

State of Idaho, Department of Health and Welfare
Bureau of Laboratories - Coeur d'Alene Branch Lab
2195 Ironwood Court, Coeur d'Alene, Idaho 83814
NON DRINKING WATER - BACTERIAL DENSITY REPORT

LAB: COEUR D'ALENE, Phone: (208) 769-1432
Branch Laboratory Supervisor, Bacteriology: Mike Brodwater

CITY OF PLUMMER
BOX B
PLUMMER, ID 83851

Tracking Number: 10602-3692/
(Please Refer to this Tracking Number on any communications)

Storet:
NPDES Number:
Matrix: WATER
Sample Location: WW TREATMENT IRRIGATION FIELD
Type of Sample: Wastewater, Chlorinated, Grab
Sample Taken From: Lagoon - G
Collected by: JANSON
Preservation: Sodium Thiosulfate AND Cooled, 4° C

Date Collected: 06/20/02 Date Received in Lab: 06/20/02
Time Collected: 08:30 Time Received in Lab: 09:37

TEST CODE		RESULTS	COMPLETED
EMPN	TOTAL COLIFORM	>1,600 /100 ML	06/23/02
EMPE	FECAL COLIFORM	130 /100 ML	06/23/02

NOTES:

LAB ID #ID00001

State of Idaho, Department of Health and Welfare
Bureau of Laboratories - Coeur d'Alene Branch Lab
2195 Ironwood Court, Coeur d'Alene, Idaho 83814
NON DRINKING WATER - BACTERIAL DENSITY REPORT

LAB: COEUR D'ALENE, Phone: (208) 769-1432
Branch Laboratory Supervisor, Bacteriology: Mike Brodwater

CITY OF PLUMMER
BOX B
PLUMMER, ID 83851

Tracking Number: 10602-3726/
(Please Refer to this Tracking Number on any communications)

Storet:
NPDES Number:
Matrix: WATER
Sample Location: IRRIGATION FIELD
Type of Sample: Wastewater, Chlorinated, Grab
Sample Taken From: Sewage Treatment Plant - P
Collected by: JANSON
Preservation: Sodium Thiosulfate AND Cooled, 4° C

Date Collected: 06/21/02
Time Collected: 09:30
Date Received in Lab: 06/21/02
Time Received in Lab: 10:45

TEST CODE		RESULTS	COMPLETED
EMPN	TOTAL COLIFORM	>1,600 /100 ML	06/25/02
EMPE	FECAL COLIFORM	300 /100 ML	06/25/02

NOTES:

LAB ID #ID00001

State of Idaho, Department of Health and Welfare
Bureau of Laboratories - Coeur d'Alene Branch Lab
2195 Ironwood Court, Coeur d'Alene, Idaho 83814
NON DRINKING WATER - BACTERIAL DENSITY REPORT

LAB: COEUR D'ALENE, Phone: (208) 769-1432
Branch Laboratory Supervisor, Bacteriology: Mike Brodwater

CITY OF PLUMMER
BOX B
PLUMMER, ID 83851

Tracking Number: 10602-3835/
(Please Refer to this Tracking Number on any communications)

Storet:
NPDES Number:
Matrix: WATER
Sample Location: IRRIGATION FLD/WWTP
Type of Sample: Wastewater, Chlorinated, Grab
Sample Taken From: Sewage Treatment Plant - P
Collected by: JANSON
Preservation: Sodium Thiosulfate AND Cooled, 4° C

Date Collected: 06/26/02 Date Received in Lab: 06/26/02
Time Collected: 09:00 Time Received in Lab: 10:13

TEST CODE		RESULTS	COMPLETED
EMPN	TOTAL COLIFORM	>1,600 /100 ML	06/29/02
EMPE	FECAL COLIFORM	130 /100 ML	06/29/02

NOTES:

LAB ID #ID00001

State of Idaho, Department of Health and Welfare
Bureau of Laboratories - Coeur d'Alene Branch Lab
2195 Ironwood Court, Coeur d'Alene, Idaho 83814
NON DRINKING WATER - BACTERIAL DENSITY REPORT

LAB: COEUR D'ALENE, Phone: (208) 769-1432
Branch Laboratory Supervisor, Bacteriology: Mike Brodwater

CITY OF PLUMMER
BOX B
PLUMMER, ID 83851

Tracking Number: 10602-3911/
(Please Refer to this Tracking Number on any communications)

Storet:	
NPDES Number:	
Matrix:	WATER
Sample Location:	WW TREATMENT PLANT IRRIG FIELD
Type of Sample:	Wastewater, Chlorinated, Grab
Sample Taken From:	Sewage Treatment Plant - P
Collected by:	JANSON
Preservation:	Sodium Thiosulfate

Date Collected: 06/28/02 Date Received in Lab: 06/28/02
Time Collected: 08:45 Time Received in Lab: 10:01

TEST CODE		RESULTS	COMPLETED
EMPN	TOTAL COLIFORM	>1,600 /100 ML	06/30/02
EMPE	FECAL COLIFORM	300 /100 ML	06/30/02

NOTES:

LAB ID #ID00001

State of Idaho, Department of Health and Welfare
Bureau of Laboratories - Coeur d'Alene Branch Lab
2195 Ironwood Court, Coeur d'Alene, Idaho 83814
NON DRINKING WATER - BACTERIAL DENSITY REPORT

LAB: COEUR D'ALENE, Phone: (208) 769-1432
Branch Laboratory Supervisor, Bacteriology: Mike Brodwater

CITY OF PLUMMER
BOX B
PLUMMER, ID 83851

Tracking Number: 10702-4039/
(Please Refer to this Tracking Number on any communications)

Storet:
NPDES Number:
Matrix: WATER
Sample Location: IRRIGATION FIELD
Type of Sample: Wastewater, Chlorinated, Grab
Sample Taken From: Sewage Treatment Plant - P
Collected by: JANSON
Preservation: Sodium Thiosulfate AND Cooled, 4° C

Date Collected: 07/03/02
Time Collected: 09:30
Date Received in Lab: 07/03/02
Time Received in Lab: 10:30

TEST CODE		RESULTS	COMPLETED
EMPN	TOTAL COLIFORM	300 /100 ML	07/06/02
EMPE	FECAL COLIFORM	30 /100 ML	07/06/02

NOTES:

LAB ID #ID00001

State of Idaho, Department of Health and Welfare
Bureau of Laboratories - Coeur d'Alene Branch Lab
2195 Ironwood Court, Coeur d'Alene, Idaho 83814
NON DRINKING WATER - BACTERIAL DENSITY REPORT

LAB: COEUR D'ALENE, Phone: (208) 769-1432
Branch Laboratory Supervisor, Bacteriology: Mike Brodwater

CITY OF PLUMMER
BOX B
PLUMMER, ID 83851

Tracking Number: 10702-4090/
(Please Refer to this Tracking Number on any communications)

Storet:
NPDES Number:
Matrix: WATER
Sample Location: WWTP IRRIGATION FIELD
Type of Sample: Wastewater, Chlorinated, Grab
Sample Taken From: Sewage Treatment Plant - P
Collected by: JANSON
Preservation: Sodium Thiosulfate AND Cooled, 4° C

Date Collected: 07/05/02
Time Collected: 09:45

Date Received in Lab: 07/05/02
Time Received in Lab: 10:24

TEST CODE		RESULTS	COMPLETED
EMPN	TOTAL COLIFORM	LAB ERROR /100 ML	07/09/02
EMPE	FECAL COLIFORM	LAB ERROR /100 ML	07/09/02

NOTES:

LAB ID #ID00001

LABORATORY ERROR. WE APOLOGIZE FOR ANY INCONVENIENCE THIS MAY CAUSE YOU. PLEASE RESUBMIT ANOTHER SAMPLE AT NO ADDITIONAL CHARGE.

State of Idaho, Department of Health and Welfare
Bureau of Laboratories - Coeur d'Alene Branch Lab
2195 Ironwood Court, Coeur d'Alene, Idaho 83814
NON DRINKING WATER - BACTERIAL DENSITY REPORT

LAB: COEUR D'ALENE, Phone: (208) 769-1432
Branch Laboratory Supervisor, Bacteriology: Mike Brodwater

CITY OF PLUMMER
BOX B
PLUMMER, ID 83851

Tracking Number: 10702-4149/
(Please Refer to this Tracking Number on any communications)

Storet:	
NPDES Number:	
Matrix:	WATER
Sample Location:	IRRIGATION FIELD
Type of Sample:	Wastewater, Chlorinated, Grab
Sample Taken From:	Sewage Treatment Plant - P
Collected by:	JANSON
Preservation:	Sodium Thiosulfate AND Cooled, 4° C

Date Collected: 07/09/02 Date Received in Lab: 07/09/02
Time Collected: 09:45 Time Received in Lab: 10:45

TEST CODE		RESULTS	COMPLETED
EMPE	FECAL COLIFORM	<2 /100 ML	07/13/02
EMPN	TOTAL COLIFORM	22 /100 ML	07/13/02

NOTES:

LAB ID #ID00001

State of Idaho, Department of Health and Welfare
Bureau of Laboratories - Coeur d'Alene Branch Lab
2195 Ironwood Court, Coeur d'Alene, Idaho 83814
NON DRINKING WATER - BACTERIAL DENSITY REPORT

LAB: COEUR D'ALENE, Phone: (208) 769-1432
Branch Laboratory Supervisor, Bacteriology: Mike Brodwater

CITY OF PLUMMER
BOX B
PLUMMER, ID 83851

Tracking Number: 10702-4202/
(Please Refer to this Tracking Number on any communications)

Storet:
NPDES Number:
Matrix: WATER
Sample Location: POND 2 INFLOW
Type of Sample: Wastewater
Sample Taken From: Sewage Treatment Plant - P
Collected by: JANSON
Preservation: Sodium Thiosulfate

Date Collected: 07/09/02 | Date Received in Lab: 07/09/02
Time Collected: 12:30 | Time Received in Lab: 16:00

TEST CODE		RESULTS	COMPLETED
EMPN	TOTAL COLIFORM	>1,600 /100 ML	07/13/02
EMPE	FECAL COLIFORM	500 /100 ML	07/13/02

NOTES:

LAB ID #ID00001

State of Idaho, Department of Health and Welfare
Bureau of Laboratories - Coeur d'Alene Branch Lab
2195 Ironwood Court, Coeur d'Alene, Idaho 83814
NON DRINKING WATER - BACTERIAL DENSITY REPORT

LAB: COEUR D'ALENE, Phone: (208) 769-1432
Branch Laboratory Supervisor, Bacteriology: Mike Brodwater

CITY OF PLUMMER
BOX B
PLUMMER, ID 83851

Tracking Number: 10702-4203/
(Please Refer to this Tracking Number on any communications)

Storet:
NPDES Number:
Matrix: WATER
Sample Location: CLS POND #1
Type of Sample: Wastewater
Sample Taken From: Sewage Treatment Plant - P
Collected by: JANSON
Preservation: Sodium Thiosulfate

Date Collected: 07/09/02 Date Received in Lab: 07/09/02
Time Collected: 13:30 Time Received in Lab: 16:00

TEST CODE		**RESULTS**	**COMPLETED**
EMPN	TOTAL COLIFORM	500 /100 ML	07/13/02
EMPE	FECAL COLIFORM	50 /100 ML	07/13/02

NOTES:

LAB ID #ID00001

State of Idaho, Department of Health and Welfare
Bureau of Laboratories - Coeur d'Alene Branch Lab
2195 Ironwood Court, Coeur d'Alene, Idaho 83814
NON DRINKING WATER - BACTERIAL DENSITY REPORT

LAB: COEUR D'ALENE, Phone: (208) 769-1432
Branch Laboratory Supervisor, Bacteriology: Mike Brodwater

CITY OF PLUMMER
BOX B
PLUMMER, ID 83851

Tracking Number: 10702-4204/
(Please Refer to this Tracking Number on any communications)

Storet:
NPDES Number:
Matrix: WATER
Sample Location: CLS POND #2
Type of Sample: Wastewater
Sample Taken From: Sewage Treatment Plant - P
Collected by: JANSON
Preservation: Sodium Thiosulfate

Date Collected: 07/09/02
Time Collected: 14:50

Date Received in Lab: 07/09/02
Time Received in Lab: 16:00

TEST CODE		RESULTS	COMPLETED
EMPN	TOTAL COLIFORM	300 /100 ML	07/13/02
EMPE	FECAL COLIFORM	30 /100 ML	07/13/02

NOTES:

LAB ID #ID00001

State of Idaho, Department of Health and Welfare
Bureau of Laboratories - Coeur d'Alene Branch Lab
2195 Ironwood Court, Coeur d'Alene, Idaho 83814
NON DRINKING WATER - BACTERIAL DENSITY REPORT

LAB: COEUR D'ALENE, Phone: (208) 769-1432
Branch Laboratory Supervisor, Bacteriology: Mike Brodwater

CITY OF PLUMMER
BOX B
PLUMMER, ID 83851

Tracking Number: 10702-4294/
(Please Refer to this Tracking Number on any communications)

Storet:
NPDES Number:
Matrix: WATER
Sample Location: WWTP IRRIGATION FIELD
Type of Sample: Wastewater, Chlorinated, Grab
Sample Taken From: Sewage Treatment Plant - P
Collected by: JANSON
Preservation: Sodium Thiosulfate AND Cooled, 4° C

Date Collected: 07/14/02 Date Received in Lab: 07/12/02
Time Collected: 08:45 Time Received in Lab: 09:54

TEST CODE		RESULTS	COMPLETED
EMPN	TOTAL COLIFORM	<2 /100 ML	07/14/02
EMPE	FECAL COLIFORM	<2 /100 ML	07/14/02

NOTES:

LAB ID #ID00001

State of Idaho, Department of Health and Welfare
Bureau of Laboratories - Coeur d'Alene Branch Lab
2195 Ironwood Court, Coeur d'Alene, Idaho 83814
NON DRINKING WATER - BACTERIAL DENSITY REPORT

LAB: COEUR D'ALENE, Phone: (208) 769-1432
Branch Laboratory Supervisor, Bacteriology: Mike Brodwater

CITY OF PLUMMER
BOX B
PLUMMER, ID 83851

Tracking Number: 10702-4318/
(Please Refer to this Tracking Number on any communications)

Storet:
NPDES Number:
Matrix: WATER
Sample Location: IRRIGATION FIELD; WWTP
Type of Sample: Wastewater, Chlorinated, Grab
Sample Taken From: Sewage Treatment Plant - P
Collected by: JANSON
Preservation: Sodium Thiosulfate AND Cooled, 4° C

Date Collected: 07/15/02
Time Collected: 09:30
Date Received in Lab: 07/15/02
Time Received in Lab: 10:40

TEST CODE		RESULTS	COMPLETED
EMPN	TOTAL COLIFORM	<2 /100 ML	07/17/02
EMPE	FECAL COLIFORM	<2 /100 ML	07/17/02

NOTES:

LAB ID #ID00001

State of Idaho, Department of Health and Welfare
Bureau of Laboratories - Coeur d'Alene Branch Lab
2195 Ironwood Court, Coeur d'Alene, Idaho 83814
NON DRINKING WATER - BACTERIAL DENSITY REPORT

LAB: COEUR D'ALENE, Phone: (208) 769-1432
Branch Laboratory Supervisor, Bacteriology: Mike Brodwater

CITY OF PLUMMER
BOX B
PLUMMER, ID 83851

Tracking Number: 10702-4460/
(Please Refer to this Tracking Number on any communications)

Storet:
NPDES Number:
Matrix: WATER
Sample Location: IRRIGATON FIELD
Type of Sample: Wastewater, Chlorinated, Grab
Sample Taken From:
Collected by: JANSON
Preservation: Sodium Thiosulfate

Date Collected: 07/19/02
Time Collected: 08:45

Date Received in Lab: 07/19/02
Time Received in Lab: 09:52

TEST CODE		RESULTS	COMPLETED
EMPN	TOTAL COLIFORM	500 /100 ML	07/22/02
EMPE	FECAL COLIFORM	17 /100 ML	07/22/02

NOTES:

LAB ID #ID00001

State of Idaho, Department of Health and Welfare
Bureau of Laboratories - Coeur d'Alene Branch Lab
2195 Ironwood Court, Coeur d'Alene, Idaho 83814
NON DRINKING WATER - BACTERIAL DENSITY REPORT

LAB: COEUR D'ALENE, Phone: (208) 769-1432
Branch Laboratory Supervisor, Bacteriology: Mike Brodwater

CITY OF PLUMMER
BOX B
PLUMMER, ID 83851

Tracking Number: 10702-4499/
(Please Refer to this Tracking Number on any communications)

Storet:
NPDES Number:
Matrix: WATER
Sample Location: IRRIGATION FIELD WWTP
Type of Sample: Wastewater, Chlorinated, Grab
Sample Taken From: Sewage Treatment Plant - P
Collected by: JANSON
Preservation: Sodium Thiosulfate AND Cooled, 4° C

Date Collected: 07/22/02 Date Received in Lab: 07/22/02
Time Collected: 10:00 Time Received in Lab: 10:59

TEST CODE		RESULTS	COMPLETED
EMPN	TOTAL COLIFORM	1,600 /100 ML	07/26/02
EMPE	FECAL COLIFORM	280 /100 ML	07/26/02

NOTES:

LAB ID #ID00001

State of Idaho, Department of Health and Welfare
Bureau of Laboratories - Coeur d'Alene Branch Lab
2195 Ironwood Court, Coeur d'Alene, Idaho 83814
NON DRINKING WATER - BACTERIAL DENSITY REPORT

LAB: COEUR D'ALENE, Phone: (208) 769-1432
Branch Laboratory Supervisor, Bacteriology: Mike Brodwater

CITY OF PLUMMER
BOX B
PLUMMER, ID 83851

Tracking Number: 10702-4646/
(Please Refer to this Tracking Number on any communications)

Storet:
NPDES Number:
Matrix: WATER
Sample Location: PLUMMER WWTP IRRIGATION
Type of Sample: Wastewater, Chlorinated, Grab
Sample Taken From: Sewage Treatment Plant - P
Collected by: JANSON
Preservation: Sodium Thiosulfate AND Cooled, 4° C

Date Collected: 07/26/02 Date Received in Lab: 07/26/02
Time Collected: 09:15 Time Received in Lab: 10:06

TEST CODE		RESULTS	COMPLETED
EMPN	TOTAL COLIFORM	2 /100 ML	07/30/02
EMPE	FECAL COLIFORM	<2 /100 ML	07/30/02

NOTES:

LAB ID #ID00001

State of Idaho, Department of Health and Welfare
Bureau of Laboratories - Coeur d'Alene Branch Lab
2195 Ironwood Court, Coeur d'Alene, Idaho 83814
NON DRINKING WATER - BACTERIAL DENSITY REPORT

LAB: COEUR D'ALENE, Phone: (208) 769-1432
Branch Laboratory Supervisor, Bacteriology: Mike Brodwater

CITY OF PLUMMER
BOX B
PLUMMER, ID 83851

Tracking Number: 10702-4685/
(Please Refer to this Tracking Number on any communications)

Storet:
NPDES Number:
Matrix: WATER
Sample Location: WWTP IRRIGATION FIELD
Type of Sample: Wastewater, Chlorinated, Grab
Sample Taken From: Sewage Treatment Plant - P
Collected by: JANSON
Preservation: Sodium Thiosulfate AND Cooled, 4° C

Date Collected: 07/29/02 Date Received in Lab: 07/29/02
Time Collected: 09:00 Time Received in Lab: 10:01

TEST CODE		RESULTS	COMPLETED
EMPN	TOTAL COLIFORM	>1,600 /100 ML	07/31/02
EMPE	FECAL COLIFORM	170 /100 ML	07/31/02

NOTES:

LAB ID #ID00001

State of Idaho, Department of Health and Welfare
Bureau of Laboratories - Coeur d'Alene Branch Lab
2195 Ironwood Court, Coeur d'Alene, Idaho 83814
NON DRINKING WATER - BACTERIAL DENSITY REPORT

LAB: COEUR D'ALENE, Phone: (208) 769-1432
Branch Laboratory Supervisor, Bacteriology: Mike Brodwater

CITY OF PLUMMER
BOX B
PLUMMER, ID 83851

Tracking Number: 10802-4846/
(Please Refer to this Tracking Number on any communications)

Storet:
NPDES Number:
Matrix: WATER
Sample Location: IRRIGATION FIELD
Type of Sample: Wastewater, Chlorinated, Grab
Sample Taken From: Sewage Treatment Plant - P
Collected by: JANSON
Preservation: Sodium Thiosulfate AND Cooled, 4° C

Date Collected: 08/02/02 Date Received in Lab: 08/02/02
Time Collected: 09:35 Time Received in Lab: 10:41

TEST CODE		RESULTS	COMPLETED
EMPN	TOTAL COLIFORM	4 /100 ML	08/05/02
EMPE	FECAL COLIFORM	<2 /100 ML	08/05/02

NOTES:

LAB ID #ID00001

APPENDIX V

Calculations

Wyatt Engineering, Inc.
1220 N. Howard Street
Spokane, WA

Plummer Waste Water Treatment

27-Sep-02
Prepared by Alan E. Gay
Wyatt Engineering

Influent Flow Calculation:

from Influent average flow data, 1999 - 2002

January	1139000	gpd	4631010	cu ft/mo
February	294000	gpd	1195362	cu ft/mo
March	333000	gpd	1353930	cu ft/mo
April	272000	gpd	1105913	cu ft/mo
May	251000	gpd	1020530	cu ft/mo
June	253000	gpd	1028661	cu ft/mo
July	174000	gpd	707458.9	cu ft/mo
August	272000	gpd	1105913	cu ft/mo
Septembei	161000	gpd	654602.8	cu ft/mo
October	175000	gpd	711524.8	cu ft/mo
November	261000	gpd	1061188	cu ft/mo
December	275000	gpd	1118110	cu ft/mo
	321666.6667	gpd	1307850	cu ft/mo

			0.054
July	2000	0.061	0.007
August	2000	0.06	0.006
September	2000	0.065	0.011
October	2000	0.04	-0.014
November	2000	0.057	0.003
November	2001	0.037	-0.017
December	2001	0.049	-0.005
January	2002	0.071	0.017
February	2002	0.107	0.053
March	2002	0.09	0.036
April	2002	0.097	0.043
May	2002	0.062	0.008
		0.066	0.012
	#NAME?		

Run-off volume: (based on hydrologic soil group c)
Hydrologic Soil Group: C
From Western Regional Climate Center
average Bayview

0.673644

	SCS CN	S	description	Precipitation	50-year dry	50-yr wet	Qavg		Q 50-yr dry	Q 50-yr we	random precip	random #	random runoff, Q
Jan.	98	0.204082	frozen ground	2.86	1.2	4.75	2.628878309	in.	0.985653183	4.513579	2.297035	0.2488	2.069065172
Feb.	98	0.204082	frozen ground	2.27	0.39	5.92	2.042218675	in.	0.220381138	5.681949	3.106935	0.813363	2.874773312
Mar.	92	0.869565	saturated	2.06	0.47	5.23	1.290919094	in.	0.075208958	4.314127	1.600416	0.281601	0.886258867
Apr.	89	1.235955	gravel	1.75	0.63	4.12	0.824618266	in.	0.090527537	2.935867	1.156205	0.144493	0.385230068
May	89	1.235955	gravel	2.06	0.66	5.57	1.077904482	in.	0.103356973	4.319761	1.803426	0.356983	0.867371935
June	89	1.235955	gravel	1.82	0.86	4.23	0.880717666	in.	0.203127521	3.039564	1.149964	0.081371	0.381067166
July	89	1.235955	gravel	1.02	0.05	1.95	0.29731403	in.	0.037433231	0.986659	0.726689	0.272668	0.134027987
Aug.	89	1.235955	gravel	1.08	0	3.29	0.335258539	in.	0	2.163869	1.188021	0.579275	0.406636847
Sep.	89	1.235955	gravel	1.21	0	3.14	0.421601013	in.	0	2.02684	1.524549	0.698439	0.649199881
Oct.	89	1.235955	gravel	2.07	0.47	4.6	1.086266401	in.	0.034031443	3.390185	1.622142	0.2878	0.724074453
Nov.	92	0.869565	saturated	2.92	1.81	7.94	2.085652383	in.	1.068296932	6.984082	3.041595	0.58671	2.200442706
Dec.	98	0.204082	frozen ground	3.22	1.86	7.75	2.98741243	in.	1.635687237	7.510365	3.917546	0.847508	3.682854323
total				24.33	20	43.72							
sum				24.34	8.4	56.49	15.95876129		4.453704154	47.86685	23.13452		15.26100272

Average of Sandpoint and Moscow, from Western Region Climate Center

Average Annual Evaporation:				Evaporative Index Parameters										
	Monthly Evaporation:			Pan Evap	AvgTemp	Pressure	Dew Pt.	wind	Corr Factor	Est. evap				
	Jan	0.00	inches	0.01	24.3	28.1896333	23	9.3	0.39088141	0.000459874				0.3
	Feb	0.00	inches	0.02	29	28.1896333	25	9.7	0.405366503	9.04661E-05				0.5
	Mar	1.02	inches	1.52	37.8	28.1896333	28	10.5	0.427801023	1.023231369				1.3
	Apr	1.29	inches	1.93	46.7	28.1896333	34	10.7	0.466558154	1.294470315				5.27
	May	3.72	inches	5.41	54.5	28.1896333	40	9.9	0.500823369	3.722068971				7.62
	Jun	4.07	inches	5.91	59.9	28.1896333	46	9.5	0.536133325	4.071708535				8.71
	Jul	5.49	inches	7.97	67.4	28.1896333	47	8.7	0.538722433	5.491778132				10.42
	Aug	5.15	inches	7.47	65.6	28.1896333	47	8.5	0.537609877	5.149812762				9.29
	Sep	3.30	inches	4.82	58.8	28.1896333	40	8.6	0.495157233	3.299897551				5.94
	Oct	1.01	inches	1.52	47.6	28.1896333	34	8.8	0.458544822	1.011686101				2.3
	Nov	0.98	inches	1.43	34.6	28.1896333	29	9.4	0.429580585	0.9776451				0.6
	Dec	0.00	inches	0.03	28.5	28.1896333	24	9	0.395966369	0.000201117				0.3
		26.04		38.04										52.54

Existing Pond Volumes
Cell 1 - Anoxic Cell 1

depth	area	volume	length	width	Regression Output:	Regression Output:	Regression Output:

Wyatt Engineering, Inc.
1220 N. Howard Street
Spokane, WA

Plummer Waste Water Treatment

27-Sep-02
Prepared by Alan E. Gay
Wyatt Engineering

											0.054		
0	79998	0	402		199	Constant		79998	Constant		0	Constant	
2	87354	167352	414		211	Std Err of Y Est		93.92	Std Err of Y Est		0.040364	Std Err of Y Est	
4	94998	349704	426		223	R Squared		1.00	R Squared		0.999404	R Squared	
6	102930	547632	438		235	No. of Observations		5.00	No. of Observations		5	No. of Observations	
8	111150	761712	450		247	Degrees of Freedom		3	Degrees of Freedom		3	Degrees of Freedom	
top	133293		471		283	X Coefficient(s)	3894		X Coefficient(s)	1.04813E-05		X Coefficient(s)	0.040857299
						Std Err of Coef.	32.79894971		Std Err of Coef.	1.35455E-07		Std Err of Coef.	0.000396573
	761930.2232					to obtain area from depth:			to obtain depth from volume:			to obtain area from volume:	
						enter depth, multiply by	3894		enter vol., multiply by	1.04813E-05		enter vol., multiply by	0.040857299
						add	79998.00		add	0.0000		add	79998.00

Cell 2 - Aeration Cell 1, Additional Cell 1

depth	area	volume	length	width		Regression Output:			Regression Output:			Regression Output:	
0	29365	0	167.8		175	Constant		29365	Constant		0	Constant	
2	33622.6	62987.6	179.8		187	Std Err of Y Est		94.94187	Std Err of Y Est		0.034974	Std Err of Y Est	
4	38168.2	134778.4	191.8		199	R Squared		0.999817	R Squared		0.999552	R Squared	
6	43001.8	215948.4	203.8		211	No. of Observations		5	No. of Observations		5	No. of Observations	
8	48123.4	307073.6	215.8		223	Degrees of Freedom		3	Degrees of Freedom		3	Degrees of Freedom	
10	53533	408730	227.8		235								
12	59230.6	521493.6	239.8		247								
top	73863		261		283	X Coefficient(s)	2488.8		X Coefficient(s)	2.28359E-05		X Coefficient(s)	0.057117026
						Std Err of Coef.	33.15513776		Std Err of Coef.	1.25791E-07		Std Err of Coef.	0.00020634
	521320.6791					to obtain area from depth:			to obtain depth from volume:			to obtain area from volume:	
						enter depth, multiply by	2488.8		enter vol., multiply by	2.28359E-05		enter vol., multiply by	0.057117026
						add	29365.00		add	0.0000		add	29365.00

Cell 3 - Aeration Cell 2

depth	area	volume	length	width		Regression Output:			Regression Output:			Regression Output:	
0	29365	0	167.8		175	Constant		29365	Constant		0	Constant	
2	33622.6	62987.6	179.8		187	Std Err of Y Est		14.40846	Std Err of Y Est		0.00402	Std Err of Y Est	
6	43001.8	216236.4	203.8		211	R Squared		0.999999	R Squared		0.999994	R Squared	
9	50792.2	356927.4	221.8		229	No. of Observations		5	No. of Observations		5	No. of Observations	
10	53533	409090	227.8		235	Degrees of Freedom		3	Degrees of Freedom		3	Degrees of Freedom	
12	59230.6	521853.6	239.8		247								
top:	62192.13					X Coefficient(s)	2479.275336		X Coefficient(s)	2.30337E-05		X Coefficient(s)	0.057332841
	1.427734848					Std Err of Coef.	5.03165175		Std Err of Coef.	9.44024E-10		Std Err of Coef.	3.66713E-06
	9412.734483					to obtain area from depth:			to obtain depth from volume:			to obtain area from volume:	
						enter depth, multiply by	2479.275336		enter vol., multiply by	2.30337E-05		enter vol., multiply by	0.057332841
						add	29365.00		add	0.0000		add	29365.00

Cell 4 & 5 -Leaky Wet Land

depth	area	volume	length	width	area	Regression Output:			Regression Output:			area fr. vol Regression Output:	
0	36	0	-6		-6	Constant		36	Constant		0	Constant	
0.5	20.25	14.0625	-4.5		-4.5	Std Err of Y Est		19.44222	Std Err of Y Est		0.065676	Std Err of Y Est	
1	9	21.375	-3		-3	R Squared		0.999837	R Squared		0.998706	R Squared	
1.5	2.25	24.1875	-1.5		-1.5	No. of Observations		5	No. of Observations		5	No. of Observations	
2	0	24.75	0		0	Degrees of Freedom		3	Degrees of Freedom		3	Degrees of Freedom	
						X Coefficient(s)	-18		X Coefficient(s)	0.069588052		X Coefficient(s)	-1.418020679
						Std Err of Coef.	6.14817046		Std Err of Coef.	1.51412E-06		Std Err of Coef.	0.000814853
						to obtain area from depth:			to obtain depth from volume:			to obtain area from volume:	
						enter depth, multiply by	-18		enter vol., multiply by	0.069588052		enter vol., multiply by	-1.418020679

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Spokane, WA

Plummer Waste Water Treatment

27-Sep-02
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Wyatt Engineering

add 36.00 add 0.0000 0.054 add 36.00

Benewah County Area, Hydrologic type C
Cald, Silt Loam
Infiltration Rate Calculation
SCS Permeability ('K') 1980
0.6 inches/hour peak
0.2 inches/hour min.
0.000423333 cm/sec, peak
0.000141111 cm/sec, min.
Check With Freeze & Cherry for this soil type:
0.00001 cm/sec, peak
0.000000001 cm/sec, min.
Utilize:
0.00001 cm/sec.
Assume sealing with human waste, 1 order of magnitude reduction:
0.000001 cm/sec.

Benewah County Area, Hydrologic type C
Lacy, Stony Loam
Infiltration Rate Calculation
SCS Permeability ('K') 1980
2 inches/hour peak
0.6 inches/hour min.
0.001411111 cm/sec, peak
0.000423333 cm/sec, min.
Check With Freeze & Cherry for this soil type:
0.001 cm/sec, peak
0.0000001 cm/sec, min.
Utilize:
0.000917222 cm/sec.
Assume sealing with human waste, 1 order of magnitude reduction:
9.17222E-05 cm/sec.

Wyatt Engineers Inc.
1220 N. Howard St.
Spokane, WA

Plummer Waste Water Treatment

Evaporative Lagoon Spreadsheet - No Equalization Basin

27-Sep-02
Prepared by Alan E. Gay
Wyatt Engineering

length 0 | width 0
0 acres

Worst Case Monthly Overflow: 0 cf/day = 0 gpd out
= 0 gpm
= 0 cfs

count: 0
Average flow balance:
302012.6 gallons/day

Average Effluent Overflow: 0 cuft/mo 0 gallons/day
Area contributing runoff: 0.91 acres
Infiltration rate: 1.00E-05 cm/s = 0.8622 ft/month, with a an impermeable geomembrane liner 1.00E-06
Average operating depth after second year: 0 feet
Initial Conditions: Ponds 1 -2 surface: 212806.4 square feet
Influent Flow: 321666.7 gpd = 42997.8 cf/day = 1307850 cuft/mo
Assume Lagoon cells 1 initially full. Pond Vol: 761712 Assume System begins operation Jan. 1
Lagoon Surface Area: 229611.2 sq.ft.

Month Name	Year	Month	Rainfall (in/mo.)	Rain Vol. (cuft/mo)	Run-offV. (cuft/mo)	Evap Rate (in/mo.)	Influent (cuft/mo)	Initial Pond vol. (cuft)	Pond Surf. (sq.ft.)	Evap Vol. (cuft/mo)	Exfilt.Vol (cuft/mo)	Effl. Vol. (cuft/mo)	Depth/pond4 (ft.)	Max depth	
January	1	1	2.523221	48279.99	7595.8	0.00	4631009.67	380856	95558.75	3.662084	82391.2	0	0	0	0
February	1	2	1.01466	19414.78	2666.08	0.00	1195361.58	1280998	170175.1	1.282923	146726	0	0	0	0
March	1	3	2.430566	46507.1	5394.15	1.02	1353929.96	761712	111150	9477.681	95834.1	0	0	0	0
April	1	4	2.160498	41339.55	3849.23	1.29	1105912.76	761712	111150	11990.03	95834.1	0	0	0	0
May	1	5	0.938875	17964.69	821.87	3.72	1020529.79	761712	111150	34475.66	95834.1	0	0	0	0
June	1	6	1.962878	37558.22	3302.37	4.07	1028661.50	761712	111150	37714.2	95834.1	0	0	0	0
July	1	7	1.495154	28608.67	2076.25	5.49	707458.90	761712	111150	50867.59	95834.1	0	0	0	0
August	1	8	2.341612	44805.03	4361.62	5.15	1105912.76	761712	111150	47700.14	95834.1	0	0	0	0
September	1	9	0.289777	5544.669	4.69711	3.30	654602.77	761712	111150	30565.3	95834.1	0	0	0	0
October	1	10	4.62584	88512.06	11307.7	1.01	711524.75	761712	111150	9370.743	95834.1	0	0	0	0
November	1	11	1.946274	37240.53	3937.28	0.98	1061188.34	761712	111150	9055.438	95834.1	0	0	0	0
December	1	12	5.915691	113192.4	18801	0.00	1118110.32	761712	111150	1.862845	95834.1	0	0	0	0
January	2	13	1.008878	19304.14	2647.51	0.00	4631009.67	761712	111150	4.259586	95834.1	0	0	0	0
February	2	14	2.17514	41619.7	6450.8	0.00	1195361.58	1614487	218738.9	1.649037	188598	0	0	0	0
March	2	15	0.036123	691.1827	85.9157	1.02	1353929.96	761712	111150	9477.681	95834.1	0	0	0	0
April	2	16	1.304747	24965.38	1614.8	1.29	1105912.76	761712	111150	11990.03	95834.1	0	0	0	0
May	2	17	0.843652	16142.67	642.915	3.72	1020529.79	761712	111150	34475.66	95834.1	0	0	0	0
June	2	18	1.791999	34288.59	2841.83	4.07	1028661.50	761712	111150	37714.2	95834.1	0	0	0	0
July	2	19	0.889067	17011.64	726.538	5.49	707458.90	761712	111150	50867.59	95834.1	0	0	0	0
August	2	20	0.938091	17949.69	820.341	5.15	1105912.76	761712	111150	47700.14	95834.1	0	0	0	0
September	2	21	0.82563	15797.82	610.655	3.30	654602.77	761712	111150	30565.3	95834.1	0	0	0	0
October	2	22	3.046241	58287.58	6429.69	1.01	711524.75	761712	111150	9370.743	95834.1	0	0	0	0
November	2	23	4.275364	81805.96	11205.8	0.98	1061188.34	761712	111150	9055.438	95834.1	0	0	0	0
December	2	24	4.132338	79069.25	12905	0.00	1118110.32	761712	111150	1.862845	95834.1	0	0	0	0
January	3	25	3.057701	58506.87	9357.17	0.00	4631009.67	761712	111150	4.259586	95834.1	0	0	0	0
February	3	26	0.912969	17468.99	2340.41	0.00	1195361.58	1660399	221371.2	1.668882	190867	0	0	0	0
March	3	27	0.197634	3781.576	2.08581	1.02	1353929.96	761712	111150	9477.681	95834.1	0	0	0	0
April	3	28	4.414624	84470.6	10643.5	1.29	1105912.76	761712	111150	11990.03	95834.1	0	0	0	0
May	3	29	5.575561	106684.3	14322.3	3.72	1020529.79	761712	111150	34475.66	95834.1	0	0	0	0
June	3	30	0.651646	12468.76	330.218	4.07	1028661.50	761712	111150	37714.2	95834.1	0	0	0	0
July	3	31	0.022501	430.5353	74.5092	5.49	707458.90	761712	111150	50867.59	95834.1	0	0	0	0

Wyatt Engineering, Inc.
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Spokane, WA

Plummer Waste Water Treatment

27-Sep-02
Prepared by Alan E. Gay
Wyatt Engineering

Influent Flow Calculation:

from Influent average flow data, 1999 - 2002

January	250000	gpd	1016464	cu ft/mo
February	205000	gpd	833500.4	cu ft/mo
March	244000	gpd	992068.8	cu ft/mo
April	183000	gpd	744051.6	cu ft/mo
May	162000	gpd	658668.6	cu ft/mo
June	164000	gpd	666800.3	cu ft/mo
July	174000	gpd	707458.9	cu ft/mo
August	183000	gpd	744051.6	cu ft/mo
Septembei	161000	gpd	654602.8	cu ft/mo
October	175000	gpd	711524.8	cu ft/mo
November	172000	gpd	699327.2	cu ft/mo
December	186000	gpd	756249.2	cu ft/mo
	188250	gpd	765397.3	cu ft/mo

			0.054
July	2000	0.061	0.007
August	2000	0.06	0.006
September	2000	0.065	0.011
October	2000	0.04	-0.014
November	2000	0.057	0.003
November	2001	0.037	-0.017
December	2001	0.049	-0.005
January	2002	0.071	0.017
February	2002	0.107	0.053
March	2002	0.09	0.036
April	2002	0.097	0.043
May	2002	0.062	0.008
		0.066	0.012

#NAME?

Run-off volume: (based on hydrologic soil group c)
Hydrologic Soil Group: C

From Western Regional Climate Center
average Bayview

	SCS CN	S	description	Precipitation	50-year dry	50-yr wet	Qavg	Q 50-yr dry	Q 50-yr we	random precip	random #	random runoff, Q
											0.420158	
Jan.	98	0.204082	frozen ground	2.86	1.2	4.75	2.628878309 in.	0.985653183	4.513579	2.820097	0.480828	2.58915958
Feb.	98	0.204082	frozen ground	2.27	0.39	5.92	2.042218675 in.	0.220381138	5.681949	3.336079	0.871629	3.103082751
Mar.	92	0.869565	saturated	2.06	0.47	5.23	1.290919094 in.	0.075208958	4.314127	1.225729	0.146997	0.575792315
Apr.	89	1.235955	gravel	1.75	0.63	4.12	0.824618266 in.	0.090527537	2.935867	2.158098	0.766921	1.160383021
May	89	1.235955	gravel	2.06	0.66	5.57	1.077904482 in.	0.103356973	4.319761	2.595536	0.77788	1.538577471
June	89	1.235955	gravel	1.82	0.86	4.23	0.880717666 in.	0.203127521	3.039564	2.415519	0.892635	1.381097291
July	89	1.235955	gravel	1.02	0.05	1.95	0.29731403 in.	0.037433231	0.986659	0.715586	0.265114	0.128725715
Aug.	89	1.235955	gravel	1.08	0	3.29	0.335258539 in.	0	2.163869	0.764641	0.27961	0.152705195
Sep.	89	1.235955	gravel	1.21	0	3.14	0.421601013 in.	0	2.02684	1.935736	0.884846	0.974930836
Oct.	89	1.235955	gravel	2.07	0.47	4.6	1.086266401 in.	0.034031443	3.390165	2.549538	0.725555	1.498120483
Nov.	92	0.869565	saturated	2.92	1.81	7.94	2.085652383 in.	1.068296932	6.984082	1.418573	0.003413	0.732740532
Dec.	98	0.204082	frozen ground	3.22	1.86	7.75	2.98741243 in.	1.635687237	7.510365	3.791806	0.799796	3.557438881
total				24.33	20	43.72						
sum				24.34	8.4	58.49	15.95876129	4.453704154	47.86685	25.72694		17.39275407

Average of Sandpoint and Moscow, from Western Region Climate Center

Average Annual Evaporation:				Evaporative Index Parameters											
	Monthly Evaporation:			Pan Evap	AvgTemp	Pressure	Dew Pt.	wind	Corr Factor	Est. evap					
	Jan	0.00	inches	0.01	24.3	28.1896333	23	9.3	0.39088141	0.000459874					0.3
	Feb	0.00	inches	0.02	29	28.1896333	25	9.7	0.405386503	9.04661E-05					0.5
	Mar	1.02	inches	1.52	37.8	28.1896333	28	10.5	0.427801023	1.023231369					1.3
	Apr	1.29	inches	1.93	46.7	28.1896333	34	10.7	0.466558154	1.294470315					5.27
	May	3.72	inches	5.41	54.5	28.1896333	40	9.9	0.500823369	3.722068971					7.62
	Jun	4.07	inches	5.91	59.9	28.1896333	46	9.5	0.536133325	4.071708535					8.71
	Jul	5.49	inches	7.97	67.4	28.1896333	47	8.7	0.538722433	5.491778132					10.42
	Aug	5.15	inches	7.47	65.6	28.1896333	47	8.5	0.537809877	5.149812762					9.29
	Sep	3.30	inches	4.82	58.8	28.1896333	40	8.6	0.495157233	3.299897551					5.94
	Oct	1.01	inches	1.52	47.6	28.1896333	34	8.8	0.458544822	1.011686101					2.3
	Nov	0.98	inches	1.43	34.6	28.1896333	29	9.4	0.429580585	0.9776451					0.6
	Dec	0.00	inches	0.03	28.5	28.1896333	24	9	0.395966369	0.000201117					0.3
		26.04		38.04											
															52.54

Existing Pond Volumes
Cell 1 - Anoxic Cell 1

depth	area	volume	length	width	Regression Output:	Regression Output:	Regression Output:

Wyatt Engineering, Inc.
1220 N. Howard Street
Spokane, WA

Plummer Waste Water Treatment

27-Sep-02
Prepared by Alan E. Gay
Wyatt Engineering

										0.054		
0	79998	0	402	199	Constant		79998	Constant		0	Constant	
2	87354	167352	414	211	Std Err of Y Est		93.92	Std Err of Y Est		0.040364	Std Err of Y Est	
4	94998	349704	426	223	R Squared		1.00	R Squared		0.999404	R Squared	
6	102930	547632	438	235	No. of Observations		5.00	No. of Observations		5	No. of Observations	
8	111150	761712	450	247	Degrees of Freedom		3	Degrees of Freedom		3	Degrees of Freedom	
top	133293		471	283	X Coefficient(s)	3894		X Coefficient(s)	1.04813E-05		X Coefficient(s)	0.040857299
					Std Err of Coef.	32.79894971		Std Err of Coef.	1.35455E-07		Std Err of Coef.	0.000396573
	761930.2232				to obtain area from depth:			to obtain depth from volume:			to obtain area from volume:	
					enter depth, multiply by	3894		enter vol., multiply by	1.04813E-05		enter vol., multiply by	0.040857299
					add	79998.00		add	0.0000		add	79998.00

Cell 2 - Aeration Cell 1, Additional Cell 1

depth	area	volume	length	width	Regression Output:			Regression Output:			Regression Output:	
0	29365	0	167.8	175	Constant		29365	Constant		0	Constant	
2	33622.6	62987.6	179.8	187	Std Err of Y Est		94.94187	Std Err of Y Est		0.034974	Std Err of Y Est	
4	38168.2	134778.4	191.8	199	R Squared		0.999817	R Squared		0.999552	R Squared	
6	43001.8	215948.4	203.8	211	No. of Observations		5	No. of Observations		5	No. of Observations	
8	48123.4	307073.6	215.8	223	Degrees of Freedom		3	Degrees of Freedom		3	Degrees of Freedom	
10	53533	408730	227.8	235								
12	59230.6	521493.6	239.8	247								
top	73863		261	283	X Coefficient(s)	2488.8		X Coefficient(s)	2.28359E-05		X Coefficient(s)	0.057117026
					Std Err of Coef.	33.15513776		Std Err of Coef.	1.25791E-07		Std Err of Coef.	0.00020634
	521320.6791				to obtain area from depth:			to obtain depth from volume:			to obtain area from volume:	
					enter depth, multiply by	2488.8		enter vol., multiply by	2.28359E-05		enter vol., multiply by	0.057117026
					add	29365.00		add	0.0000		add	29365.00

Cell 3 - Aeration Cell 2

depth	area	volume	length	width	Regression Output:			Regression Output:			Regression Output:	
0	29365	0	167.8	175	Constant		29365	Constant		0	Constant	
2	33622.6	62987.6	179.8	187	Std Err of Y Est		14.40846	Std Err of Y Est		0.00402	Std Err of Y Est	
6	43001.8	216236.4	203.8	211	R Squared		0.999999	R Squared		0.999994	R Squared	
9	50792.2	356927.4	221.8	229	No. of Observations		5	No. of Observations		5	No. of Observations	
10	53533	409090	227.8	235	Degrees of Freedom		3	Degrees of Freedom		3	Degrees of Freedom	
12	59230.6	521853.6	239.8	247								
top:	62192.13				X Coefficient(s)	2479.275336		X Coefficient(s)	2.30337E-05		X Coefficient(s)	0.057332841
	1.427734848				Std Err of Coef.	5.03165175		Std Err of Coef.	9.44024E-10		Std Err of Coef.	3.66713E-06
	9412.734483				to obtain area from depth:			to obtain depth from volume:			to obtain area from volume:	
					enter depth, multiply by	2479.275336		enter vol., multiply by	2.30337E-05		enter vol., multiply by	0.057332841
					add	29365.00		add	0.0000		add	29365.00

Cell 4 & 5 -Equalization Basin

depth	area	volume	length	width	area Regression Output:			Regression Output:			area fr. vol Regression Output:	
0	316344	0	588	538	Constant		316344	Constant		0	Constant	
1	319731	318037.5	591	541	Std Err of Y Est		19.44222	Std Err of Y Est		0.065676	Std Err of Y Est	
2	323136	639471	594	544	R Squared		0.999837	R Squared		0.998706	R Squared	
3	326559	964318.5	597	547	No. of Observations		5	No. of Observations		5	No. of Observations	
4	330000	1292598	600	550	Degrees of Freedom		3	Degrees of Freedom		3	Degrees of Freedom	
	gallons:	9669926										
					X Coefficient(s)	3414		X Coefficient(s)	3.09444E-06		X Coefficient(s)	0.010564622
					Std Err of Coef.	6.14817046		Std Err of Coef.	1.51412E-06		Std Err of Coef.	0.000814853
					to obtain area from depth:			to obtain depth from volume:			to obtain area from volume:	
					enter depth, multiply by	3414		enter vol., multiply by	3.09444E-06		enter vol., multiply by	0.010564622

Wyatt Engineering, Inc.
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Spokane, WA

Plummer Waste Water Treatment

27-Sep-02
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Wyatt Engineering

add 316344.00 add 0.0000 add 0.054 316344.00

Benewah County Area, Hydrologic type C
Cald, Silt Loam
Infiltration Rate Calculation
SCS Permeability ('K') 1980
0.6 inches/hour peak
0.2 inches/hour min.
0.000423333 cm/sec. peak
0.000141111 cm/sec. min.
Check With Freeze & Cherry for this soil type:
0.00001 cm/sec. peak
0.000000001 cm/sec. min.
Utilize:
0.00001 cm/sec.
Assume sealing with human waste, 1 order of magnitude reduction:
0.000001 cm/sec.

Benewah County Area, Hydrologic type C
Lacy, Stony Loam
Infiltration Rate Calculation
SCS Permeability ('K') 1980
2 inches/hour peak
0.6 inches/hour min.
0.001411111 cm/sec. peak
0.000423333 cm/sec. min.
Check With Freeze & Cherry for this soil type:
0.001 cm/sec. peak
0.0000001 cm/sec. min.
Utilize:
0.000917222 cm/sec.
Assume sealing with human waste, 1 order of magnitude reduction:
9.17222E-05 cm/sec.

Wyatt Engineers Inc.
1220 N. Howard St.
Spokane, WA

Plummer Waste Water Treatment

Evaporative Lagoon Spreadsheet - Equalization Basin

27-Sep-02
Prepared by Alan E. Gay
Wyatt Engineering

length 600 width 550
7.575758 acres

Worst Case Monthly Overflow: 0 cf/day = 0 gpd out
= 0 gpm
= 0 cfs

count: 0
Average flow balance:
190103.3 gallons/day

Average Effluent Overflow: 0 cuft/mo 0 gallons/day
Area contributing runoff: 0.91 acres
Infiltration rate: 1.00E-09 cm/s = 8.6E-05 ft/month, with a an impermeable geomembrane liner 1.00E-10
Average operating depth after second year: 2.409213 feet
Initial Conditions: Ponds 1 -2 surface: 212806.4 square feet
Influent Flow: 188250 gpd = 25163.7 cf/day = 765397.3 cuft/mo
Assume Lagoon cells 1 initially full. Pond Vol: 761712 Assume System begins operation Jan. 1
Lagoon Surface Area: 559611.2 sq.ft.

Month Name	Year	Month	Rainfall (in/mo.)	Rain Vol. (cuft/mo)	Run-offV. (cuft/mo)	Evap Rate (in/mo.)	Influent (cuft/mo)	Initial Pond vol. (cuft)	Pond Surf. (sq.ft.)	Evap Vol. (cuft/mo)	Exfilt.Vol (cuft/mo)	Effl. Vol. (cuft/mo)	Depth/pond4 (ft.)	Max depth	
January	1	1	5.130666	239264.8	16204.8	0.00	1016463.93	380856	95558.75	3.662084	8.23912	0	0	0	0
February	1	2	3.75975	175333.2	11674.3	0.00	833500.42	889433.7	147810.1	1.114316	12.7443	0	0	0	0
March	1	3	4.703985	219366.9	12585.2	1.02	992068.80	1146584	162497.7	13856.06	14.0106	0	0	0	0
April	1	4	0.622713	29039.78	289.775	1.29	744051.60	1593390	217529.4	23465.44	18.7555	0	0	0	0
May	1	5	4.430298	206603.7	10692.7	3.72	658668.63	1579943	216758.4	67232.48	18.689	0	0	0	0
June	1	6	0.553451	25809.77	201.395	4.07	666800.34	1625313	219359.6	74430.7	18.9133	0	0	0	0
July	1	7	1.766147	82362.95	2773.29	5.49	707458.90	1480331	211047.4	96585.44	18.1966	0	0	0	0
August	1	8	2.833324	132130	5794.47	5.15	744051.60	1412979	207185.9	88914.03	17.8637	0	0	0	0
September	1	9	0	0	0	3.30	654602.77	1442679	208888.7	57442.6	18.0105	0	0	0	0
October	1	10	3.703874	172727.5	8431.7	1.01	711524.75	1276477	169916.8	14325.21	14.6503	0	0	0	0
November	1	11	4.020701	187502.4	10389.7	0.98	699327.18	1391477	205953.1	16779.09	17.7574	0	0	0	0
December	1	12	1.161462	54163.91	3139.23	0.00	756249.16	1508556	212665.6	3.564219	18.3361	0	0	0	0
January	2	13	1.221101	56945.17	3332.24	0.00	1016463.93	1558742	215542.9	8.26022	18.5842	0	0	0	0
February	2	14	3.633806	169459.9	11258.4	0.00	833500.42	1872112	546663.6	4.121209	47.1336	0	0.207492083	0.2074921	0
March	2	15	0.526548	24555.2	336.916	1.02	992068.80	2122936	549313.4	46839.56	47.3621	0	0.983650022	0.98365	0
April	2	16	1.411929	65844.29	1871.26	1.29	744051.60	2329666	551497.5	59491.43	47.5504	0	1.623363406	1.6233634	0
May	2	17	3.141	146478.2	6714.71	3.72	658668.63	2318550	551380	171022.9	47.5402	0	1.588966137	1.5889661	0
June	2	18	1.69428	79011.51	2584.5	4.07	666800.34	2195997	550085.3	186648.9	47.4286	0	1.209733793	1.2097338	0
July	2	19	0	0	0	5.49	707458.90	1994353	547955	250770.6	47.2449	0	0.585758673	0.5857587	0
August	2	20	1.955041	91171.91	3280.98	5.15	744051.60	1687650	222933.6	95672.17	19.2214	0	0	0	0
September	2	21	1.354568	63169.31	1732.89	3.30	654602.77	1667119	221756.5	60981.13	19.1199	0	0	0	0
October	2	22	2.986622	139278.9	6251.07	1.01	711524.75	1562280	215745.7	18188.91	18.6017	0	0	0	0
November	2	23	2.442019	113881.7	5429.15	0.98	699327.18	1637783	220074.5	17929.57	18.9749	0	0	0	0
December	2	24	2.446376	114085	7342.85	0.00	756249.16	1675129	222215.7	3.724277	19.1595	0	0	0	0
January	3	25	3.120109	145504	9563.01	0.00	1016463.93	1789439	228769.4	8.767097	19.7246	0	0	0	0
February	3	26	0.16703	7789.312	159.706	0.00	833500.42	2197597	550102.2	4.147132	47.4301	0	1.214685287	1.2146853	0
March	3	27	0.697889	32545.55	652.403	1.02	992068.80	2275651	550926.8	46977.13	47.5012	0	1.456218231	1.4562182	0
April	3	28	1.117107	52095.48	1189.97	1.29	744051.60	2490549	553197.1	59674.77	47.6969	0	2.121207386	2.1212074	0
May	3	29	0.287991	13430.23	4.31734	3.72	658668.63	2464820	552925.3	171502.2	47.6735	0	2.04158926	2.0415893	0
June	3	30	2.925209	136415	6067.67	4.07	666800.34	2202029	550149	186670.5	47.4341	0	1.228399449	1.2283994	0
July	3	31	0.835836	38978.62	628.858	5.49	707458.90	2061250	548661.8	251094.1	47.3059	0	0.792767338	0.7927673	0

Wyatt Engineering, Inc.
1220 N. Howard Street
Spokane, WA

Plummer Waste Water Treatment

27-Sep-02
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Wyatt Engineering

[redacted]

Adjusted Flow for Tribal input: 50000 gpd

from Influent average flow data, 1999 - 2002

January	250000	gpd	1016464	cu ft/mo
February	205000	gpd	833500.4	cu ft/mo
March	244000	gpd	992068.8	cu ft/mo
April	183000	gpd	744051.6	cu ft/mo
May	162000	gpd	658668.6	cu ft/mo
June	164000	gpd	666800.3	cu ft/mo
July	174000	gpd	707458.9	cu ft/mo
August	183000	gpd	744051.6	cu ft/mo
September	161000	gpd	654602.8	cu ft/mo
October	175000	gpd	711524.8	cu ft/mo
November	172000	gpd	699327.2	cu ft/mo
December	186000	gpd	756249.2	cu ft/mo
	188250	gpd	765397.3	cu ft/mo

			0.054
July	2000	0.061	0.007
August	2000	0.06	0.006
September	2000	0.065	0.011
October	2000	0.04	-0.014
November	2000	0.057	0.003
November	2001	0.037	-0.017
December	2001	0.049	-0.005
January	2002	0.071	0.017
February	2002	0.107	0.053
March	2002	0.09	0.036
April	2002	0.097	0.043
May	2002	0.062	0.008
		0.066	0.012

#NAME?

Run-off volume: (based on hydrologic soil group c)
Hydrologic Soil Group: C
From Western Regional Climate Center
average Bayview

	SCS CN	S	description	Precipitation	50-year dry	50-yr wet	Qavg		Q 50-yr dry	Q 50-yr we	random precip	random # (0.698576)	random runoff, Q
Jan.	98	0.204082	frozen ground	2.86	1.2	4.75	2.628878309	in.	0.985653183	4.513579	2.662622	0.406016	2.432462842
Feb.	98	0.204082	frozen ground	2.27	0.39	5.92	2.042218675	in.	0.220381138	5.681949	2.421245	0.563914	2.1924818
Mar.	92	0.869565	saturated	2.06	0.47	5.23	1.290919094	in.	0.075208958	4.314127	2.591796	0.748229	1.778326754
Apr.	89	1.235955	gravel	1.75	0.63	4.12	0.824618266	in.	0.090527537	2.935867	2.256187	0.816978	1.243798628
May	89	1.235955	gravel	2.06	0.66	5.57	1.077904482	in.	0.103356973	4.319761	3.015253	0.913818	1.913619788
June	89	1.235955	gravel	1.82	0.86	4.23	0.880717666	in.	0.203127521	3.039564	1.83289	0.510712	0.891123088
July	89	1.235955	gravel	1.02	0.05	1.95	0.29731403	in.	0.037433231	0.986659	0.692258	0.249598	0.117835798
Aug.	89	1.235955	gravel	1.08	0	3.29	0.335258539	in.	0	2.163869	1.706201	0.8769	0.789883831
Sep.	89	1.235955	gravel	1.21	0	3.14	0.421601013	in.	0	2.02684	1.547817	0.711706	0.666892915
Oct.	89	1.235955	gravel	2.07	0.47	4.6	1.086266401	in.	0.034031443	3.390185	1.845337	0.389421	0.90119219
Nov.	92	0.869565	saturated	2.92	1.81	7.94	2.085652383	in.	1.068296932	6.984082	3.711332	0.92304	2.839432499
Dec.	98	0.204082	frozen ground	3.22	1.86	7.75	2.98741243	in.	1.635687237	7.510365	2.414111	0.117983	2.185372733
total				24.33	20	43.72							
sum				24.34	8.4	58.49	15.95876129		4.453704154	47.86685	26.69705		17.95240287

Average of Sandpoint and Moscow, from Western Region Climate Center

Average Annual Evaporation:				Evaporative Index Parameters											
	Monthly Evaporation:			Pan Evap	AvgTemp	Pressure	Dew Pt.	wind	Corr Factor	Est. evap					
	Jan	0.00	inches	0.01	24.3	28.1896333	23	9.3	0.39088141	0.000459874					0.3
	Feb	0.00	inches	0.02	29	28.1896333	25	9.7	0.405366503	9.04661E-05					0.5
	Mar	1.02	inches	1.52	37.8	28.1896333	28	10.5	0.427801023	1.023231369					1.3
	Apr	1.29	inches	1.93	46.7	28.1896333	34	10.7	0.466558154	1.294470315					5.27
	May	3.72	inches	5.41	54.5	28.1896333	40	9.9	0.500823369	3.722068971					7.62
	Jun	4.07	inches	5.91	59.9	28.1896333	46	9.5	0.536133325	4.071708535					8.71
	Jul	5.49	inches	7.97	67.4	28.1896333	47	8.7	0.538722433	5.491778132					10.42
	Aug	5.15	inches	7.47	65.6	28.1896333	47	8.5	0.537809877	5.149812762					9.29
	Sep	3.30	inches	4.82	58.8	28.1896333	40	8.6	0.495157233	3.299897551					5.94
	Oct	1.01	inches	1.52	47.6	28.1896333	34	8.8	0.458544822	1.011686101					2.3
	Nov	0.98	inches	1.43	34.6	28.1896333	29	9.4	0.429580585	0.9776451					0.6
	Dec	0.00	inches	0.03	28.5	28.1896333	24	9	0.395966369	0.000201117					0.3
		26.04		38.04											52.54

Existing Pond Volumes
Cell 1 - Anoxic Cell 1

depth area volume length width

Regression Output:

Regression Output:

Regression Output:

Wyatt Engineering, Inc.
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Spokane, WA

Plummer Waste Water Treatment

27-Sep-02
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Wyatt Engineering

					Adjusted Flow for Tribal input: 50000 gpd					0.054		
0	79998	0	402	199	Constant		79998	Constant		0	Constant	
2	87354	167352	414	211	Std Err of Y Est		93.92	Std Err of Y Est		0.040364	Std Err of Y Est	
4	94998	349704	426	223	R Squared		1.00	R Squared		0.999404	R Squared	
6	102930	547632	438	235	No. of Observations		5.00	No. of Observations		5	No. of Observations	
8	111150	761712	450	247	Degrees of Freedom		3	Degrees of Freedom		3	Degrees of Freedom	
top	133293		471	283	X Coefficient(s)	3894		X Coefficient(s)	1.04813E-05		X Coefficient(s)	0.040857299
					Std Err of Coef.	32.79894971		Std Err of Coef.	1.35455E-07		Std Err of Coef.	0.000396573
	761930.2232				to obtain area from depth:			to obtain depth from volume:			to obtain area from volume:	
					enter depth, multiply by	3894		enter vol., multiply by	1.04813E-05		enter vol., multiply by	0.040857299
					add	79998.00		add	0.0000		add	79998.00

[redacted] Aeration Cell 1& Aeration Cell 2

depth	area	volume	length	width	Regression Output:			Regression Output:			Regression Output:	
0	29365	0	167.8	175	Constant		29365	Constant		0	Constant	
2	33622.6	62987.6	179.8	187	Std Err of Y Est		94.94187	Std Err of Y Est		0.034974	Std Err of Y Est	
4	38168.2	134778.4	191.8	199	R Squared		0.999817	R Squared		0.999552	R Squared	
6	43001.8	215948.4	203.8	211	No. of Observations		5	No. of Observations		5	No. of Observations	
8	48123.4	307073.6	215.8	223	Degrees of Freedom		3	Degrees of Freedom		3	Degrees of Freedom	
10	53533	408730	227.8	235								
12	59230.6	521493.6	239.8	247								
top	73863		261	283	X Coefficient(s)	2488.8		X Coefficient(s)	2.28359E-05		X Coefficient(s)	0.057117026
					Std Err of Coef.	33.15513776		Std Err of Coef.	1.25791E-07		Std Err of Coef.	0.00020634
	521320.6791				to obtain area from depth:			to obtain depth from volume:			to obtain area from volume:	
					enter depth, multiply by	2488.8		enter vol., multiply by	2.28359E-05		enter vol., multiply by	0.057117026
					add	29365.00		add	0.0000		add	29365.00

Cell 3 - Sand Filter--Cell 1, Add Cell 1, Cell 2, Add Cell 2

depth	area	volume	length	width	Regression Output:			Regression Output:			Regression Output:	
0	4984	0	178	28	Constant		4984	Constant		0	Constant	
1	6256	5620	184	34	Std Err of Y Est		14.40846	Std Err of Y Est		0.00402	Std Err of Y Est	
2	7600	12548	190	40	R Squared		0.999999	R Squared		0.999994	R Squared	
3	9016	20856	196	46	No. of Observations		5	No. of Observations		5	No. of Observations	
4	10504	30616	202	52	Degrees of Freedom		3	Degrees of Freedom		3	Degrees of Freedom	
7	15400	69472	220	70								
top:	16170				X Coefficient(s)	1491.891892		X Coefficient(s)	9.73647E-05		X Coefficient(s)	0.146592572
	0.371212121				Std Err of Coef.	5.03165175		Std Err of Coef.	9.44024E-10		Std Err of Coef.	3.66713E-06
	9412.734483				to obtain area from depth:			to obtain depth from volume:			to obtain area from volume:	
					enter depth, multiply by	1491.891892		enter vol., multiply by	9.73647E-05		enter vol., multiply by	0.146592572
					add	4984.00		add	0.0000		add	4984.00

Cell 4 & 5 -Equalization Basin

depth	area	volume	length	width	area Regression Output:			Regression Output:			area fr. vol Regression Output:	
0	328329	0	573	573	Constant		328329	Constant		0	Constant	
2	335241	663570	579	579	Std Err of Y Est		19.44222	Std Err of Y Est		0.065676	Std Err of Y Est	
4	342225	1341036	585	585	R Squared		0.999837	R Squared		0.998706	R Squared	
6	349281	2032542	591	591	No. of Observations		5	No. of Observations		5	No. of Observations	
9	360000	3096464	600	600	Degrees of Freedom		3	Degrees of Freedom		3	Degrees of Freedom	
					X Coefficient(s)	3519.442623		X Coefficient(s)	2.90529E-06		X Coefficient(s)	0.010226037
					Std Err of Coef.	6.14817046		Std Err of Coef.	1.51412E-06		Std Err of Coef.	0.000814853
					to obtain area from depth:			to obtain depth from volume:			to obtain area from volume:	
					enter depth, multiply by	3519.442623		enter vol., multiply by	2.90529E-06		enter vol., multiply by	0.010226037

Wyatt Engineering, Inc.
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Plummer Waste Water Treatment

27-Sep-02
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Adjusted Flow for Tribal input: 50000 gpd

					0.054		
add	328329.00	add		0.0000	add		328329.00

Benewah County Area, Hydrologic type C
Cald, Silt Loam
Infiltration Rate Calculation
SCS Permeability ('K') 1980
0.6 inches/hour peak
0.2 inches/hour min.
0.000423333 cm/sec, peak
0.000141111 cm/sec, min.
Check With Freeze & Cherry for this soil type:
0.00001 cm/sec, peak
0.000000001 cm/sec, min.
Utilize:
0.00001 cm/sec.
Assume sealing with human waste, 1 order of magnitude reduction:
0.000001 cm/sec.

Benewah County Area, Hydrologic type C
Lacy, Stony Loam
Infiltration Rate Calculation
SCS Permeability ('K') 1980
2 inches/hour peak
0.6 inches/hour min.
0.001411111 cm/sec, peak
0.000423333 cm/sec, min.
Check With Freeze & Cherry for this soil type:
0.001 cm/sec, peak
0.0000001 cm/sec, min.
Utilize:
0.000917222 cm/sec.
Assume sealing with human waste, 1 order of magnitude reduction:
9.17222E-05 cm/sec.

Wyatt Engineers Inc.
1220 N. Howard St.
Spokane, WA

Plummer Waste Water Treatment

~~Evaporative Lagoon~~ Spreadsheet - Equalization Basin

27-Sep-02
Prepared by Alan E. Gay
Wyatt Engineering

length 600 width 600
8.264463 acres

Worst Case Monthly Overflow: 0 cf/day = 0 gpd out
= 0 gpm
= 0 cfs

count: 0
Average flow balance:
198816.3 gallons/day

Average Effluent Overflow: 0 cuft/mo 0 gallons/day
Area contributing runoff: 0.86 acres
Infiltration rate: 1.00E-09 cm/s = 8.6E-05 ft/month, with a an impermeable geomembrane liner 1.00E-10
Average operating depth after second year: 1.696088 feet
Initial Conditions: Ponds 1 -2 surface: 169777.4 square feet
Influent Flow: 188250 gpd = 25163.7 cf/day = 765397.3 cuft/mo
Assume Lagoon cells 1 initially full. Pond Vol: 761712 Assume System begins operation Jan. 1
Lagoon Surface Area: 545780.6 sq.ft.

Month Name	Year	Month	Rainfall (in/mo.)	Rain Vol. (cuft/mo)	Run-offV. (cuft/mo)	Evap Rate (in/mo.)	Influent (cuft/mo)	Initial Pond vol. (cuft)	Pond Surf. (sq.ft.)	Evap Vol. (cuft/mo)	Exfilt.Vol (cuft/mo)	Effl. Vol. (cuft/mo)	Depth/pond4 (ft.)	Max depth	
January	1	1	5.244177	238514.2	15665.8	0.00	1016463.93	380856	95558.75	3.662084	8.23912	0	0	0	0
February	1	2	0	0	0	0.00	833500.42	761712	111150	0.837942	9.58341	0	0	0	0
March	1	3	3.05509	138950.7	6924.65	1.02	992068.80	761712	111150	9477.681	9.58341	0	0	0	0
April	1	4	2.284215	103890	3966.66	1.29	744051.60	761712	111150	11990.03	9.58341	0	0	0	0
May	1	5	0	0	0	3.72	658668.63	761712	111150	34475.66	9.58341	0	0	0	0
June	1	6	1.140129	51855.04	1171.83	4.07	666800.34	1037703	156278.8	53026.81	13.4744	0	0	0	0
July	1	7	0.939467	42728.59	777.634	5.49	707458.90	761712	111150	50867.59	9.58341	0	0	0	0
August	1	8	1.990562	90534.18	3191.81	5.15	744051.60	1461800	515225.5	221109.6	44.423	0	0.317031959	0.317032	0
September	1	9	0	0	0	3.30	654602.77	2078424	521531.1	143416.6	44.9667	0	2.10850176	2.1085018	0
October	1	10	3.740083	170105.4	8072.18	1.01	711524.75	2576226	526621.7	44397.98	45.4056	0	3.55476272	3.5547627	0
November	1	11	4.176048	189933.8	10286.8	0.98	699327.18	3313010	534156	43517.92	46.0552	0	5.695332496	5.6953325	0
December	1	12	2.175662	98952.85	6096.66	0.00	756249.16	3978560	540962	9.066382	46.642	0	7.628946415	7.6289464	0
January	2	13	2.215173	100749.9	6219.35	0.00	1016463.93	761712	111150	4.259586	9.58341	0	0	0	0
February	2	14	0.591513	26903.02	1257.13	0.00	833500.42	761712	111150	0.837942	9.58341	0	0	0	0
March	2	15	2.939326	133685.6	6582.54	1.02	992068.80	761712	111150	9477.681	9.58341	0	0	0	0
April	2	16	3.563388	162069	7558.56	1.29	744051.60	761712	111150	11990.03	9.58341	0	0	0	0
May	2	17	2.109682	95951.97	3502.84	3.72	658668.63	761712	111150	34475.66	9.58341	0	0	0	0
June	2	18	2.390943	108744.2	4254.47	4.07	666800.34	1137158	161959.4	54954.28	13.9642	0	0	0	0
July	2	19	1.035647	47103.01	960.797	5.49	707458.90	911156.9	149050.9	68212.85	12.8512	0	0	0	0
August	2	20	2.530112	115073.8	4633.97	5.15	744051.60	1598454	516622.9	221709.3	44.5435	0	0.71405133	0.7140513	0
September	2	21	0.948993	43161.83	795.253	3.30	654602.77	2240460	523188.1	143872.3	45.1095	0	2.57926313	2.5792631	0
October	2	22	0	0	0	1.01	711524.75	2781764	528723.5	44575.18	45.5868	0	4.151907894	4.1519079	0
November	2	23	2.620166	119169.6	5646.61	0.98	699327.18	3340192	534434	43540.57	46.0792	0	5.774304938	5.7743049	0
December	2	24	1.51559	68931.63	4053.34	0.00	756249.16	3930315	540468.6	9.058113	46.5995	0	7.488781502	7.4887815	0
January	3	25	6.96643	316845.2	21048.5	0.00	1016463.93	761712	111150	4.259586	9.58341	0	0	0	0
February	3	26	2.545606	115778.6	7246.52	0.00	833500.42	761712	111150	0.837942	9.58341	0	0	0	0
March	3	27	0	0	0	1.02	992068.80	761712	111150	9477.681	9.58341	0	0	0	0
April	3	28	0.990631	45055.61	873.645	1.29	744051.60	761712	111150	11990.03	9.58341	0	0	0	0
May	3	29	2.039907	92778.49	3320.06	3.72	658668.63	761712	111150	34475.66	9.58341	0	0	0	0
June	3	30	1.78248	81070.25	2661.22	4.07	666800.34	1133802	161767.7	54889.23	13.9477	0	0	0	0
July	3	31	1.313166	59725.05	1544.46	5.49	707458.90	878598.6	147191.2	67361.79	12.6909	0	0	0	0

Wyatt Engineers Inc.
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Plummer Waste Water Treatment

Evaporative Lagoon Spreadsheet - Equalization Basin

27-Sep-02
Prepared by Alan E. Gay
Wyatt Engineering

length 600 width 600
8.264463 acres

August	3	32	0	0	0	5.15	744051.60	1579952	516433.7	221628.1	44.5272	0	0.660299265	0.6602993	0
September	3	33	1.29279	58798.3	1499.25	3.30	654602.77	2102331	521775.6	143483.8	44.9877	0	2.177961243	2.1779612	0
October	3	34	2.398579	109091.5	4275.17	1.01	711524.75	2660365	527482.1	44470.52	45.4798	0	3.799208631	3.7992086	0
November	3	35	3.498863	159134.3	8246.39	0.98	699327.18	3332265	534352.9	43533.96	46.0722	0	5.751272936	5.7512729	0
December	3	36	6.650256	302465.1	20060.1	0.00	756249.16	3964958	540822.9	9.064051	46.63	0	7.589430804	7.5894308	0
January	4	37	5.559551	252857.9	16651.2	0.00	1016463.93	761712	111150	4.259586	9.58341	0	0	0	0
February	4	38	0	0	0	0.00	833500.42	761712	111150	0.837942	9.58341	0	0	0	0
March	4	39	3.756416	170848.2	9019.59	1.02	992068.80	761712	111150	9477.681	9.58341	0	0	0	0
April	4	40	2.633222	119763.5	4917.91	1.29	744051.60	761712	111150	11990.03	9.58341	0	0	0	0
May	4	41	4.769885	216942.6	11113.5	3.72	658668.63	761712	111150	34475.66	9.58341	0	0	0	0
June	4	42	1.539344	70012	2066.37	4.07	666800.34	1265759	169304.7	57446.61	14.5975	0	0	0	0
July	4	43	0.746151	33936.23	448.982	5.49	707458.90	996344.9	153916.5	70439.62	13.2708	0	0	0	0
August	4	44	0	0	0	5.15	744051.60	1667736	517331.4	222013.3	44.6046	0	0.915336035	0.915336	0
September	4	45	0.391129	17789.23	46.9766	3.30	654602.77	2189730	522669.3	143729.6	45.0648	0	2.431878555	2.4318786	0
October	4	46	1.683727	76578.78	2415.97	1.01	711524.75	2705056	527939.1	44509.05	45.5192	0	3.929049198	3.9290492	0
November	4	47	4.560501	207419.4	11454.1	0.98	699327.18	3342545	534458.1	43542.53	46.0812	0	5.781141166	5.7811412	0
December	4	48	3.41003	155094	9939.48	0.00	756249.16	4026723	541454.5	9.074636	46.6845	0	7.768875638	7.7688756	0
January	5	49	2.401904	109242.7	6799.61	0.00	1016463.93	761712	111150	4.259586	9.58341	0	0	0	0
February	5	50	0	0	0	0.00	833500.42	761712	111150	0.837942	9.58341	0	0	0	0
March	5	51	0.385254	17522.01	129.287	1.02	992068.80	761712	111150	9477.681	9.58341	0	0	0	0
April	5	52	0.169813	7723.402	16.1689	1.29	744051.60	761712	111150	11990.03	9.58341	0	0	0	0
May	5	53	1.865785	84859.09	2871.53	3.72	658668.63	761712	111150	34475.66	9.58341	0	0	0	0
June	5	54	3.169307	144145.5	6425.08	4.07	666800.34	1125434	161289.7	54727.06	13.9065	0	0	0	0
July	5	55	0.188579	8576.895	9.12949	5.49	707458.90	937232	150540.2	68894.44	12.9796	0	0	0	0
August	5	56	0	0	0	5.15	744051.60	1584369	516478.9	221647.5	44.5311	0	0.673131943	0.6731319	0
September	5	57	1.101973	50119.64	1093.42	3.30	654602.77	2106729	521820.6	143496.2	44.9916	0	2.190737593	2.1907376	0
October	5	58	1.591162	72368.78	2190.52	1.01	711524.75	2655665	527434	44466.47	45.4756	0	3.785555962	3.785556	0
November	5	59	2.707197	123128	5900.66	0.98	699327.18	3288762	533908.1	43497.72	46.0338	0	5.624885496	5.6248855	0
December	5	60	1.791292	81471.01	4905	0.00	756249.16	3883140	539986.2	9.050028	46.5579	0	7.351724849	7.3517248	0
January	6	61	2.157878	98144	6041.44	0.00	1016463.93	761712	111150	4.259586	9.58341	0	0	0	0
February	6	62	2.969433	135054.9	8566.08	0.00	833500.42	761712	111150	0.837942	9.58341	0	0	0	0
March	6	63	1.760018	80048.65	3205.3	1.02	992068.80	761712	111150	9477.681	9.58341	0	0	0	0
April	6	64	3.000014	136445.8	5944.18	1.29	744051.60	761712	111150	11990.03	9.58341	0	0	0	0
May	6	65	4.286199	194943.7	9676.22	3.72	658668.63	761712	111150	34475.66	9.58341	0	0	0	0
June	6	66	1.023409	46546.41	936.867	4.07	666800.34	1242323	167966.1	56992.41	14.4821	0	0	0	0
July	6	67	0	0	0	5.49	707458.90	948768	151199.1	69195.98	13.0365	0	0	0	0
August	6	68	1.596091	72592.96	2202.41	5.15	744051.60	1587018	516506	221659.1	44.5334	0	0.68082629	0.6808263	0
September	6	69	0	0	0	3.30	654602.77	2184161	522612.4	143713.9	45.0599	0	2.415700362	2.4157004	0
October	6	70	0	0	0	1.01	711524.75	2681667	527699.9	44488.89	45.4985	0	3.861097186	3.8610972	0
November	6	71	3.635529	165350.1	8656.19	0.98	699327.18	3240182	533411.3	43457.24	45.991	0	5.483745202	5.4837452	0
December	6	72	4.417768	200927.7	13084.5	0.00	756249.16	3879578	539949.8	9.049418	46.5547	0	7.34137536	7.3413754	0
January	7	73	3.799162	172792.4	11153.4	0.00	1016463.93	761712	111150	4.259586	9.58341	0	0	0	0
February	7	74	2.649484	120503.1	7569.76	0.00	833500.42	761712	111150	0.837942	9.58341	0	0	0	0
March	7	75	0.91809	41756.3	1073.73	1.02	992068.80	761712	111150	9477.681	9.58341	0	0	0	0

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Plummer Waste Water Treatment

Evaporative Lagoon Spreadsheet - Equalization Basin

27-Sep-02
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length 600 width 600
8.264463 acres

April	7	76	0.513875	23371.91	148.086	1.29	744051.60	761712	111150	11990.03	9.58341	0	0	0	0
May	7	77	2.894962	131667.8	5647.91	3.72	658668.63	761712	111150	34475.66	9.58341	0	0	0	0
June	7	78	3.797439	172714.1	8239.52	4.07	666800.34	1175019	164121.9	55688.04	14.1507	0	0	0	0
July	7	79	1.435299	65279.87	1821.98	5.49	707458.90	1016239	155052.8	70959.64	13.3687	0	0	0	0
August	7	80	0.552743	25139.7	189.496	5.15	744051.60	1719827	517864.1	222241.9	44.6505	0	1.066673935	1.0666739	0
September	7	81	0.488151	22201.95	123.001	3.30	654602.77	2266921	523458.7	143946.7	45.1329	0	2.656140824	2.6561408	0
October	7	82	4.013714	182550.6	8873.02	1.01	711524.75	2786518	528772.1	44579.28	45.591	0	4.165721727	4.1657217	0
November	7	83	1.633721	74304.43	2862.38	0.98	699327.18	3536367	536440.1	43704	46.2521	0	6.344247799	6.3442478	0
December	7	84	4.442982	202074.5	13163.2	0.00	756249.16	4078676	541985.8	9.08354	46.7303	0	7.919813696	7.9198137	0
January	8	85	3.270538	148749.7	9504.52	0.00	1016463.93	761712	111150	4.259586	9.58341	0	0	0	0
February	8	86	4.632188	210679.9	13754.1	0.00	833500.42	761712	111150	0.837942	9.58341	0	0	0	0
March	8	87	0.759869	34560.14	738.052	1.02	992068.80	761712	111150	9477.681	9.58341	0	0	0	0
April	8	88	2.978638	135473.6	5883.76	1.29	744051.60	761712	111150	11990.03	9.58341	0	0	0	0
May	8	89	1.711595	77846.29	2484.71	3.72	658668.63	761712	111150	34475.66	9.58341	0	0	0	0
June	8	90	2.173172	98839.58	3670.51	4.07	666800.34	1118034	160867.1	54583.65	13.87	0	0	0	0
July	8	91	0.317948	14460.84	11.9878	5.49	707458.90	881915.3	147380.7	67448.49	12.7072	0	0	0	0
August	8	92	0.401913	18279.69	53.8584	5.15	744051.60	1536386	515988.2	221436.9	44.4887	0	0.533725478	0.5337255	0
September	8	93	0.399625	18175.63	52.3634	3.30	654602.77	2077290	521519.5	143413.4	44.9657	0	2.10520731	2.1052073	0
October	8	94	1.374848	62530.44	1683.27	1.01	711524.75	2593324	526796.5	44412.72	45.4206	0	3.604435126	3.6044351	0
November	8	95	2.984604	135744.9	6716.2	0.98	699327.18	3216129	533165.3	43437.21	45.9698	0	5.413864014	5.413864	0
December	8	96	3.633163	165242.5	10635.5	0.00	756249.16	3824000	539381.4	9.039893	46.5057	0	7.179904685	7.1799047	0
January	9	97	5.317144	241832.8	15893.7	0.00	1016463.93	761712	111150	4.259586	9.58341	0	0	0	0
February	9	98	2.475195	112576.1	7027.5	0.00	833500.42	761712	111150	0.837942	9.58341	0	0	0	0
March	9	99	2.073131	94289.54	4076.02	1.02	992068.80	761712	111150	9477.681	9.58341	0	0	0	0
April	9	100	0.077719	3534.777	84.2596	1.29	744051.60	761712	111150	11990.03	9.58341	0	0	0	0
May	9	101	0.53859	24496.02	173.945	3.72	658668.63	761712	111150	34475.66	9.58341	0	0	0	0
June	9	102	1.031317	46906.09	952.311	4.07	666800.34	1062373	157687.9	53504.92	13.5959	0	0	0	0
July	9	103	0	0	0	5.49	707458.90	772681.6	141141.5	64593.17	12.1693	0	0	0	0
August	9	104	1.17604	53488.31	1246.94	5.15	744051.60	1415535	514752.4	220906.5	44.3822	0	0.182619255	0.1826193	0
September	9	105	1.734135	78871.45	2540.58	3.30	654602.77	1993371	520661.4	143177.4	44.8917	0	1.861399708	1.8613997	0
October	9	106	1.051344	47816.93	991.744	1.01	711524.75	2572825	526586.9	44395.05	45.4026	0	3.544881232	3.5448812	0
November	9	107	0.506788	23049.57	288.319	0.98	699327.18	3180243	532798.4	43407.31	45.9381	0	5.309605469	5.3096055	0
December	9	108	1.032742	46970.9	2573.95	0.00	756249.16	3669020	537796.6	9.013331	46.3691	0	6.729645659	6.7296457	0
January	10	109	2.603661	118419	7427.16	0.00	1016463.93	761712	111150	4.259586	9.58341	0	0	0	0
February	10	110	0	0	0	0.00	833500.42	761712	111150	0.837942	9.58341	0	0	0	0
March	10	111	3.882819	176597.3	9400.41	1.02	992068.80	761712	111150	9477.681	9.58341	0	0	0	0
April	10	112	2.146669	97634.18	3600.36	1.29	744051.60	761712	111150	11990.03	9.58341	0	0	0	0
May	10	113	3.669394	166890.3	7866.34	3.72	658668.63	761712	111150	34475.66	9.58341	0	0	0	0
June	10	114	0	0	0	4.07	666800.34	1212460	166260.4	56413.65	14.335	0	0	0	0
July	10	115	1.070795	48701.61	1030.48	5.49	707458.90	872000.4	146814.3	67189.32	12.6584	0	0	0	0
August	10	116	1.958585	89079.79	3109.17	5.15	744051.60	1561989	516250	221549.2	44.5113	0	0.608111361	0.6081114	0
September	10	117	2.209015	100469.8	3765.71	3.30	654602.77	2176636	522535.4	143692.8	45.0533	0	2.393837991	2.393838	0
October	10	118	3.164728	143937.3	6412.02	1.01	711524.75	2778398	528689.1	44572.28	45.5838	0	4.142130633	4.1421306	0
November	10	119	1.914847	87090.54	3632.59	0.98	699327.18	3487179	535937.1	43663.02	46.2087	0	6.201344222	6.2013442	0

Wyatt Engineers Inc.
1220 N. Howard St.
Spokane, WA

Plummer Waste Water Treatment

Evaporative Lagoon Spreadsheet - Equalization Basin

27-Sep-02
Prepared by Alan E. Gay
Wyatt Engineering

length 600 width 600

8.264463 acres

December	10	120	2.924055	132991	8424.71	0.00	756249.16	4043086	541621.8	9.077441	46.6989	0	7.816414323	7.8164143	0
January	11	121	4.30055	195596.4	12718.4	0.00	1016463.93	761712	111150	4.259586	9.58341	0	0	0	0
February	11	122	0.66104	30065.22	1460.1	0.00	833500.42	761712	111150	0.837942	9.58341	0	0	0	0
March	11	123	2.382355	108353.6	4957.67	1.02	992068.80	761712	111150	9477.681	9.58341	0	0	0	0
April	11	124	2.143333	97482.46	3591.55	1.29	744051.60	761712	111150	11990.03	9.58341	0	0	0	0
May	11	125	3.942856	179327.9	8665.05	3.72	658668.63	761712	111150	34475.66	9.58341	0	0	0	0
June	11	126	3.084692	140297.1	6184.21	4.07	666800.34	1225696	167016.4	56670.18	14.4002	0	0	0	0
July	11	127	0.936596	42597.99	772.347	5.49	707458.90	1031461	155922.3	71357.55	13.4437	0	0	0	0
August	11	128	0.311546	14169.63	9.96525	5.15	744051.60	1710920	517773	222202.8	44.6426	0	1.040796499	1.0407965	0
September	11	129	0.619946	28196.19	270.236	3.30	654602.77	2246903	523254	143890.4	45.1152	0	2.597984148	2.5979841	0
October	11	130	0.704961	32062.85	387.104	1.01	711524.75	2772699	528630.8	44567.37	45.5788	0	4.125571405	4.1255714	0
November	11	131	4.165918	189473.1	10256.1	0.98	699327.18	3363585	534673.2	43560.05	46.0998	0	5.842267666	5.8422677	0
December	11	132	2.387994	108610.1	6756.36	0.00	756249.16	4028601	541473.7	9.074958	46.6861	0	7.774331244	7.7743312	0
January	12	133	1.840432	83706	5057.12	0.00	1016463.93	761712	111150	4.259586	9.58341	0	0	0	0
February	12	134	1.733004	78820.02	4724.68	0.00	833500.42	761712	111150	0.837942	9.58341	0	0	0	0
March	12	135	2.544027	115706.7	5425.15	1.02	992068.80	761712	111150	9477.681	9.58341	0	0	0	0
April	12	136	1.040366	47317.63	970.071	1.29	744051.60	761712	111150	11990.03	9.58341	0	0	0	0
May	12	137	3.283765	149351.3	6752.4	3.72	658668.63	761712	111150	34475.66	9.58341	0	0	0	0
June	12	138	0.769416	34994.35	485.319	4.07	666800.34	1193807	165195	56052.15	14.2432	0	0	0	0
July	12	139	1.510978	68721.89	1999.07	5.49	707458.90	889188.6	147796.1	67638.61	12.743	0	0	0	0
August	12	140	0.633432	28809.56	287.732	5.15	744051.60	1599717	516635.8	221714.8	44.5446	0	0.717721321	0.7177213	0
September	12	141	1.708895	77723.5	2478.04	3.30	654602.77	2151107	522274.4	143621	45.0307	0	2.319667285	2.3196673	0
October	12	142	2.143283	97480.21	3591.42	1.01	711524.75	2728907	528183	44529.61	45.5402	0	3.998342894	3.9983429	0
November	12	143	1.49811	68136.6	2500.87	0.98	699327.18	3388453	534927.5	43580.77	46.1217	0	5.91451477	5.9145148	0
December	12	144	2.489281	113216.8	7071.32	0.00	756249.16	3924356	540407.7	9.057092	46.5942	0	7.471469406	7.4714694	0
January	13	145	3.434647	156213.7	10016.3	0.00	1016463.93	761712	111150	4.259586	9.58341	0	0	0	0
February	13	146	1.855327	84383.46	5103.24	0.00	833500.42	761712	111150	0.837942	9.58341	0	0	0	0
March	13	147	1.946055	88509.91	3719.53	1.02	992068.80	761712	111150	9477.681	9.58341	0	0	0	0
April	13	148	0.691023	31428.91	366.909	1.29	744051.60	761712	111150	11990.03	9.58341	0	0	0	0
May	13	149	1.595304	72557.16	2200.51	3.72	658668.63	761712	111150	34475.66	9.58341	0	0	0	0
June	13	150	2.362424	107447.1	4177.27	4.07	666800.34	1112461	160548.7	54475.64	13.8426	0	0	0	0
July	13	151	0	0	0	5.49	707458.90	885564.3	147589.1	67543.87	12.7252	0	0	0	0
August	13	152	0.995829	45292.03	883.585	5.15	744051.60	1525467	515876.5	221389	44.4791	0	0.502001913	0.5020019	0
September	13	153	1.734303	78879.08	2541	3.30	654602.77	2094260	521693.1	143461.1	44.9806	0	2.154512232	2.1545122	0
October	13	154	3.174811	144395.8	6440.78	1.01	711524.75	2673439	527615.8	44481.79	45.4913	0	3.83719263	3.8371926	0
November	13	155	3.437424	156340	8062.55	0.98	699327.18	3382798	534869.7	43576.06	46.1167	0	5.898085237	5.8980852	0
December	13	156	0.905093	41165.18	2187.58	0.00	756249.16	4012471	541308.7	9.072194	46.6719	0	7.727468102	7.7274681	0
January	14	157	5.16975	235129.1	15433.2	0.00	1016463.93	761712	111150	4.259586	9.58341	0	0	0	0
February	14	158	1.796615	81713.14	4921.48	0.00	833500.42	761712	111150	0.837942	9.58341	0	0	0	0
March	14	159	1.987583	90398.69	3835.6	1.02	992068.80	761712	111150	9477.681	9.58341	0	0	0	0
April	14	160	1.242896	56529.04	1389.98	1.29	744051.60	761712	111150	11990.03	9.58341	0	0	0	0
May	14	161	2.188902	99555.01	3712.24	3.72	658668.63	761712	111150	34475.66	9.58341	0	0	0	0
June	14	162	3.328887	151403.5	6881.89	4.07	666800.34	1140971	162177.1	55028.17	13.983	0	0	0	0
July	14	163	1.161272	52816.62	1215.9	5.49	707458.90	960182.2	151851	69494.35	13.0927	0	0	0	0

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Plummer Waste Water Treatment

Evaporative Lagoon Spreadsheet - Equalization Basin

27-Sep-02
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length 600 width 600
8.264463 acres

August	14	164	0.58521	26616.37	227.123	5.15	744051.60	1652166	517172.2	221945	44.5908	0	0.870100881	0.8701009	0
September	14	165	1.462536	66518.65	1885.29	3.30	654602.77	2201072	522785.3	143761.5	45.0748	0	2.464830057	2.4648301	0
October	14	166	2.192727	99729	3722.4	1.01	711524.75	2766933	528571.8	44562.4	45.5737	0	4.108821896	4.1088219	0
November	14	167	4.696284	213595.1	11867.6	0.98	699327.18	3428826	535340.4	43614.41	46.1573	0	6.03181235	6.0318123	0
December	14	168	2.520396	114631.9	7168.1	0.00	756249.16	4119521	542403.4	9.090541	46.7663	0	8.038481133	8.0384811	0
January	15	169	3.731997	169737.6	10943.8	0.00	1016463.93	761712	111150	4.259586	9.58341	0	0	0	0
February	15	170	6.128482	278733.9	18429.2	0.00	833500.42	761712	111150	0.837942	9.58341	0	0	0	0
March	15	171	0.356708	16223.69	99.3434	1.02	992068.80	761712	111150	9477.681	9.58341	0	0	0	0
April	15	172	0.080138	3644.809	81.6858	1.29	744051.60	761712	111150	11990.03	9.58341	0	0	0	0
May	15	173	4.02273	182960.6	8899.51	3.72	658668.63	761712	111150	34475.66	9.58341	0	0	0	0
June	15	174	3.545694	161264.3	7507.3	4.07	666800.34	1229564	167237.3	56745.12	14.4193	0	0	0	0
July	15	175	0.953243	43355.14	803.153	5.49	707458.90	1057544	157412	72039.33	13.5721	0	0	0	0
August	15	176	0.458007	20830.95	96.1132	5.15	744051.60	1737108	518040.8	222317.8	44.6657	0	1.116881947	1.1168819	0
September	15	177	0	0	0	3.30	654602.77	2279724	523589.6	143982.7	45.1441	0	2.693338971	2.693339	0
October	15	178	0.921354	41904.75	744.466	1.01	711524.75	2776961	528674.4	44571.04	45.5826	0	4.137954811	4.1379548	0
November	15	179	5.118393	232793.3	13156.4	0.98	699327.18	3378043	534821.1	43572.1	46.1125	0	5.884272187	5.8842722	0
December	15	180	2.338828	106373.9	6603.53	0.00	756249.16	4089268	542094.1	9.085356	46.7396	0	7.950584822	7.9505848	0
January	16	181	0.888758	40422.22	2138.37	0.00	1016463.93	761712	111150	4.259586	9.58341	0	0	0	0
February	16	182	1.483892	67489.96	3955.66	0.00	833500.42	761712	111150	0.837942	9.58341	0	0	0	0
March	16	183	4.501213	204722.9	11273.7	1.02	992068.80	761712	111150	9477.681	9.58341	0	0	0	0
April	16	184	3.120868	141942.4	6287.07	1.29	744051.60	761712	111150	11990.03	9.58341	0	0	0	0
May	16	185	0.913203	41534.03	729.686	3.72	658668.63	761712	111150	34475.66	9.58341	0	0	0	0
June	16	186	2.649882	120521.2	4964	4.07	666800.34	1079967	158692.8	53845.9	13.6826	0	0	0	0
July	16	187	0.210522	9574.889	3.50798	5.49	707458.90	867561	146560.8	67073.27	12.6365	0	0	0	0
August	16	188	0	0	0	5.15	744051.60	1517512	515795.2	221354.1	44.4721	0	0.478892717	0.4788927	0
September	16	189	1.038248	47221.31	965.906	3.30	654602.77	2040165	521139.9	143309	44.9329	0	1.99735096	1.997351	0
October	16	190	1.809575	82302.59	2729.3	1.01	711524.75	2586263	526724.3	44406.64	45.4144	0	3.583922365	3.5839224	0
November	16	191	3.848233	175024.3	9296.13	0.98	699327.18	3229892	533306.1	43448.67	45.9819	0	5.453851802	5.4538518	0
December	16	192	2.071174	94200.55	5772.34	0.00	756249.16	3879611	539950.1	9.049424	46.5548	0	7.341472389	7.3414724	0
January	17	193	4.886771	222258.8	14549.2	0.00	1016463.93	761712	111150	4.259586	9.58341	0	0	0	0
February	17	194	2.538346	115448.3	7223.94	0.00	833500.42	761712	111150	0.837942	9.58341	0	0	0	0
March	17	195	0	0	0	1.02	992068.80	761712	111150	9477.681	9.58341	0	0	0	0
April	17	196	0.708416	32219.98	392.169	1.29	744051.60	761712	111150	11990.03	9.58341	0	0	0	0
May	17	197	2.29639	104443.8	3999.34	3.72	658668.63	761712	111150	34475.66	9.58341	0	0	0	0
June	17	198	0.77303	35158.75	491.051	4.07	666800.34	1146146	162472.8	55128.47	14.0085	0	0	0	0
July	17	199	1.908277	86791.73	2979.92	5.49	707458.90	842622.1	145136.3	66421.38	12.5137	0	0	0	0
August	17	200	0.874151	39757.91	660.18	5.15	744051.60	1573419	516366.9	221599.4	44.5214	0	0.641316939	0.6413169	0
September	17	201	1.01149	46004.29	913.727	3.30	654602.77	2136245	522122.4	143579.2	45.0176	0	2.276488467	2.2764885	0
October	17	202	3.42009	155551.6	7144.34	1.01	711524.75	2680803	527691.1	44488.14	45.4978	0	3.858587291	3.8585873	0
November	17	203	0.490221	22296.1	263.972	0.98	699327.18	3402015	535066.2	43592.07	46.1337	0	5.953916161	5.9539162	0
December	17	204	3.713272	168886	10885.4	0.00	756249.16	3889829	540054.6	9.051175	46.5638	0	7.371159198	7.3711592	0
January	18	205	1.598213	72689.48	4308.21	0.00	1016463.93	761712	111150	4.259586	9.58341	0	0	0	0
February	18	206	0.088928	4044.603	28.7174	0.00	833500.42	761712	111150	0.837942	9.58341	0	0	0	0
March	18	207	0.383497	17442.1	127.353	1.02	992068.80	761712	111150	9477.681	9.58341	0	0	0	0

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length 600 width 600
8.264463 acres

April	18	208	2.021554	91943.74	3272.26	1.29	744051.60	761712	111150	11990.03	9.58341		0	0	0	0
May	18	209	1.849714	84128.17	2830.73	3.72	658668.63	761712	111150	34475.66	9.58341		0	0	0	0
June	18	210	1.611137	73277.26	2238.79	4.07	666800.34	1124662	161245.6	54712.1	13.9027		0	0	0	0
July	18	211	2.757742	125426.8	5263.65	5.49	707458.90	861420.7	146210.1	66912.77	12.6063		0	0	0	0
August	18	212	1.608259	73146.37	2231.82	5.15	744051.60	1632645	516972.6	221859.3	44.5736		0	0.813385262	0.8133853	0
September	18	213	0.81006	36842.94	551.064	3.30	654602.77	2230171	523082.9	143843.3	45.1005		0	2.549370722	2.5493707	0
October	18	214	4.059469	184631.6	9007.52	1.01	711524.75	2764940	528551.5	44560.68	45.572		0	4.103031927	4.1030319	0
November	18	215	3.734537	169853.1	8953.76	0.98	699327.18	3517023	536242.3	43687.89	46.2351		0	6.28804879	6.2880488	0
December	18	216	2.703612	122964.9	7738.24	0.00	756249.16	4160989	542827.5	9.097648	46.8028		0	8.158955353	8.1589554	0
January	19	217	0	0	0	0.00	1016463.93	761712	111150	4.259586	9.58341		0	0	0	0
February	19	218	4.7922	217957.5	14253.8	0.00	833500.42	761712	111150	0.837942	9.58341		0	0	0	0
March	19	219	2.720985	123755.1	5940.99	1.02	992068.80	761712	111150	9477.681	9.58341		0	0	0	0
April	19	220	2.55205	116071.6	4694.19	1.29	744051.60	761712	111150	11990.03	9.58341		0	0	0	0
May	19	221	0	0	0	3.72	658668.63	761712	111150	34475.66	9.58341		0	0	0	0
June	19	222	0.468654	21315.18	105.291	4.07	666800.34	1037703	156278.8	53026.81	13.4744		0	0	0	0
July	19	223	0	0	0	5.49	707458.90	761712	111150	50867.59	9.58341		0	0	0	0
August	19	224	3.313862	150720.1	6838.74	5.15	744051.60	1418294	514780.6	220918.6	44.3846		0	0.19063379	0.1906338	0
September	19	225	1.675064	76184.77	2394.68	3.30	654602.77	2098941	521740.9	143474.3	44.9847		0	2.168111442	2.1681114	0
October	19	226	1.38164	62839.35	1698.72	1.01	711524.75	2675266	527634.4	44483.37	45.4929		0	3.842500765	3.8425008	0
November	19	227	3.41148	155160	7984.99	0.98	699327.18	3298324	534005.9	43505.68	46.0422		0	5.6526666	5.6526666	0
December	19	228	3.060469	139195.4	8849.73	0.00	756249.16	3926811	540432.8	9.057513	46.5964		0	7.478600656	7.4786007	0
January	20	229	1.270135	57767.9	3298.65	0.00	1016463.93	761712	111150	4.259586	9.58341		0	0	0	0
February	20	230	4.547418	206824.4	13489.3	0.00	833500.42	761712	111150	0.837942	9.58341		0	0	0	0
March	20	231	2.838643	129106.4	6286.07	1.02	992068.80	761712	111150	9477.681	9.58341		0	0	0	0
April	20	232	1.469767	66847.54	1902.18	1.29	744051.60	761712	111150	11990.03	9.58341		0	0	0	0
May	20	233	2.160526	98264.45	3637.01	3.72	658668.63	761712	111150	34475.66	9.58341		0	0	0	0
June	20	234	2.632475	119729.5	4915.85	4.07	666800.34	1139605	162099.1	55001.7	13.9763		0	0	0	0
July	20	235	2.420274	110078.2	4334.07	5.49	707458.90	925202.8	149853.1	68580	12.9204		0	0	0	0
August	20	236	0.351408	15982.64	25.3566	5.15	744051.60	1678481	517441.3	222060.5	44.614		0	0.946553405	0.9465534	0
September	20	237	0	0	0	3.30	654602.77	2216436	522942.4	143804.7	45.0883		0	2.509466752	2.5094668	0
October	20	238	0.124249	5651.052	42.489	1.01	711524.75	2713850	528029	44516.63	45.5269		0	3.954599816	3.9545998	0
November	20	239	4.423592	201192.6	11037.8	0.98	699327.18	3278031	533798.3	43488.78	46.0243		0	5.59370852	5.5937085	0
December	20	240	1.961308	89203.67	5431.61	0.00	756249.16	3955620	540727.4	9.06245	46.6218		0	7.56229901	7.562299	0
totals:			481.2063	21886087	1059724	520.861	183695361.6			12622050	6044.29		0			
average annual totals:			24.06031	1094304	52986.2	26.04305	9184768.079	(in.)		631102.5	302.215		0	(cu.ft.)		
				average:	average:		average:			average:	average:	average:		(gallons)		
				peak:	peak:		peak:			peak:	peak:	peak:		(gallons)	count:	0

Wyatt Engineering, Inc.
1220 N. Howard Street
Spokane, WA

Plummer Waste Water Treatment

27-Sep-02
Prepared by Alan E. Gay
Wyatt Engineering

Influent Flow Calculation:

from Influent average flow data, 1999 - 2002

January	250000	gpd	1016464	cu ft/mo
February	205000	gpd	833500.4	cu ft/mo
March	244000	gpd	992068.8	cu ft/mo
April	183000	gpd	744051.6	cu ft/mo
May	162000	gpd	658668.6	cu ft/mo
June	164000	gpd	666800.3	cu ft/mo
July	174000	gpd	707458.9	cu ft/mo
August	183000	gpd	744051.6	cu ft/mo
Septembei	161000	gpd	654602.8	cu ft/mo
October	175000	gpd	711524.8	cu ft/mo
November	172000	gpd	699327.2	cu ft/mo
December	186000	gpd	756249.2	cu ft/mo
	188250	gpd	765397.3	cu ft/mo

			0.054
July	2000	0.061	0.007
August	2000	0.06	0.006
September	2000	0.065	0.011
October	2000	0.04	-0.014
November	2000	0.057	0.003
November	2001	0.037	-0.017
December	2001	0.049	-0.005
January	2002	0.071	0.017
February	2002	0.107	0.053
March	2002	0.09	0.036
April	2002	0.097	0.043
May	2002	0.062	0.008
		0.066	0.012

#NAME?

Run-off volume: (based on hydrologic soil group c)
Hydrologic Soil Group: C

From Western Regional Climate Center
average Bayview

0.509477

	SCS CN	S	description	Precipitation	50-year dry	50-yr wet	Qavg		Q 50-yr dry	Q 50-yr we	random precip	random #	random runoff, Q
Jan.	98	0.204082	frozen ground	2.86	1.2	4.75	2.628878309	in.	0.985653163	4.513579	2.965953	0.550789	2.734365008
Feb.	98	0.204082	frozen ground	2.27	0.39	5.92	2.042218675	in.	0.220381138	5.681949	3.743335	0.941487	3.509098341
Mar.	92	0.869565	saturated	2.06	0.47	5.23	1.290919094	in.	0.075208958	4.314127	1.524922	0.250456	0.821960646
Apr.	89	1.235955	gravel	1.75	0.63	4.12	0.824618266	in.	0.090527537	2.935867	2.141884	0.757972	1.146683036
May	89	1.235955	gravel	2.06	0.66	5.57	1.077904482	in.	0.103356973	4.319761	1.392359	0.170099	0.550752302
June	89	1.235955	gravel	1.82	0.86	4.23	0.880717666	in.	0.203127521	3.039564	0.677485	0.008651	0.111119809
July	89	1.235955	gravel	1.02	0.05	1.95	0.29731403	in.	0.037433231	0.986659	0.868337	0.393015	0.218990854
Aug.	89	1.235955	gravel	1.08	0	3.29	0.335258539	in.	0	2.163869	1.038569	0.469421	0.308917424
Sep.	89	1.235955	gravel	1.21	0	3.14	0.421601013	in.	0	2.02684	1.047276	0.393978	0.314402182
Oct.	89	1.235955	gravel	2.07	0.47	4.6	1.086266401	in.	0.034031443	3.390185	0.110134	0.007146	0.017094187
Nov.	92	0.869565	saturated	2.92	1.81	7.94	2.085652383	in.	1.068296932	6.984082	2.833999	0.438427	2.004746561
Dec.	98	0.204082	frozen ground	3.22	1.86	7.75	2.98741243	in.	1.635687237	7.510365	4.580839	0.977317	4.344720301
total				24.33	20	43.72							
sum				24.34	8.4	58.49	15.95876129		4.453704154	47.86685	22.94509		16.08285065

Average of Sandpoint and Moscow, from Western Region Climate Center

Average Annual Evaporation:				Evaporative Index Parameters											
	Monthly Evaporation:			Pan Evap	AvgTemp	Pressure	Dew Pt.	wind	Corr Factor	Est. evap					
	Jan	0.00	inches	0.01	24.3	28.1896333	23	9.3	0.39088141	0.000459874					0.3
	Feb	0.00	inches	0.02	29	28.1896333	25	9.7	0.405386503	9.04661E-05					0.5
	Mar	1.02	inches	1.52	37.8	28.1896333	28	10.5	0.427801023	1.023231369					1.3
	Apr	1.29	inches	1.93	46.7	28.1896333	34	10.7	0.466558154	1.294470315					5.27
	May	3.72	inches	5.41	54.5	28.1896333	40	9.9	0.500823369	3.722068971					7.62
	Jun	4.07	inches	5.91	59.9	28.1896333	46	9.5	0.536133325	4.071708535					8.71
	Jul	5.49	inches	7.97	67.4	28.1896333	47	8.7	0.538722433	5.491778132					10.42
	Aug	5.15	inches	7.47	65.6	28.1896333	47	8.5	0.537809877	5.149812762					9.29
	Sep	3.30	inches	4.82	58.8	28.1896333	40	8.6	0.495157233	3.299897551					5.94
	Oct	1.01	inches	1.52	47.6	28.1896333	34	8.8	0.458544822	1.011686101					2.3
	Nov	0.98	inches	1.43	34.6	28.1896333	29	9.4	0.429580585	0.9776451					0.6
	Dec	0.00	inches	0.03	28.5	28.1896333	24	9	0.395966369	0.000201117					0.3
		26.04		38.04											52.54

Existing Pond Volumes
Cell 1 - Mechanical Plant

depth	area	volume	length	width

Regression Output:

Regression Output:

Regression Output:

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Plummer Waste Water Treatment

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											0.054		
	0	-792	0	24	-33	Constant		-792	Constant		0	Constant	
	2	-756	-1548	36	-21	Std Err of Y Est		93.92	Std Err of Y Est		0.040364	Std Err of Y Est	
	6	1080	-576	72	15	R Squared		1.00	R Squared		0.999404	R Squared	
	10	2268	2772	84	27	No. of Observations		5.00	No. of Observations		5	No. of Observations	
	12	3744	8784	96	39	Degrees of Freedom		3	Degrees of Freedom		3	Degrees of Freedom	
top		8775		117	75	X Coefficient(s)	366.1791045		X Coefficient(s)	0.000932371		X Coefficient(s)	0.419388869
						Std Err of Coef.	32.79894971		Std Err of Coef.	1.35455E-07		Std Err of Coef.	0.000396573
		761930.2232				to obtain area from depth:			to obtain depth from volume:			to obtain area from volume:	
						enter depth, multiply by	366.1791045		enter vol., multiply by	0.000932371		enter vol., multiply by	0.419388869
						add	-792.00		add	0.0000		add	-792.00
Cell 2 - Equalization Basin													
depth		area	volume	length	width	Regression Output:			Regression Output:			Regression Output:	
	0	352716	0	646	546	Constant		352716	Constant		0	Constant	
	1	359904	356310	652	552	Std Err of Y Est		94.94187	Std Err of Y Est		0.034974	Std Err of Y Est	
	2	367164	719844	658	558	R Squared		0.999817	R Squared		0.999552	R Squared	
	4	381900	1468908	670	570	No. of Observations		5	No. of Observations		5	No. of Observations	
	6	396924	2247732	682	582	Degrees of Freedom		3	Degrees of Freedom		3	Degrees of Freedom	
	8	412236	3056892	694	594								
	9	420000	3473010	700	600								
top		165996		261	636	X Coefficient(s)	7477.680934		X Coefficient(s)	2.5893E-06		X Coefficient(s)	0.019366745
						Std Err of Coef.	33.15513776		Std Err of Coef.	1.25791E-07		Std Err of Coef.	0.00020634
		521320.6791				to obtain area from depth:			to obtain depth from volume:			to obtain area from volume:	
						enter depth, multiply by	7477.680934		enter vol., multiply by	2.5893E-06		enter vol., multiply by	0.019366745
						add	352716.00		add	0.0000		add	352716.00
Cell 3 -													
depth		area	volume	length	width	Regression Output:			Regression Output:			Regression Output:	
	0	0	0	0	0	Constant		#NUM!	Constant		#NUM!	Constant	
	0	0	0	0	0	Std Err of Y Est		14.40846	Std Err of Y Est		0.00402	Std Err of Y Est	
	0	0	0	0	0	R Squared		0.999999	R Squared		0.999994	R Squared	
	0	0	0	0	0	No. of Observations		5	No. of Observations		5	No. of Observations	
	0	0	0	0	0	Degrees of Freedom		3	Degrees of Freedom		3	Degrees of Freedom	
	0	0	0	0	0								
top:		0				X Coefficient(s)	#NUM!		X Coefficient(s)	#NUM!		X Coefficient(s)	#NUM!
		0				Std Err of Coef.	5.03165175		Std Err of Coef.	9.44024E-10		Std Err of Coef.	3.66713E-06
		9412.734483				to obtain area from depth:			to obtain depth from volume:			to obtain area from volume:	
						enter depth, multiply by	#NUM!		enter vol., multiply by	#NUM!		enter vol., multiply by	#NUM!
						add	#NUM!		add	#NUM!		add	#NUM!
Cell 4 & 5													
depth		area	volume	length	width	area Regression Output:			Regression Output:			area fr. vol Regression Output:	
	0	0	0	0	0	Constant		0	Constant		0	Constant	
	0	0	0	0	0	Std Err of Y Est		19.44222	Std Err of Y Est		0.065676	Std Err of Y Est	
	0	0	0	0	0	R Squared		0.999837	R Squared		0.998706	R Squared	
	0	0	0	0	0	No. of Observations		5	No. of Observations		5	No. of Observations	
	0	0	0	0	0	Degrees of Freedom		3	Degrees of Freedom		3	Degrees of Freedom	
						X Coefficient(s)	#NUM!		X Coefficient(s)	#NUM!		X Coefficient(s)	#NUM!
						Std Err of Coef.	6.14817046		Std Err of Coef.	1.51412E-06		Std Err of Coef.	0.000814853
						to obtain area from depth:			to obtain depth from volume:			to obtain area from volume:	
						enter depth, multiply by	#NUM!		enter vol., multiply by	#NUM!		enter vol., multiply by	#NUM!

Plummer Waste Water Treatment

27-Sep-02
Prepared by Alan E. Gay
Wyatt Engineering

add 0.00 add 0.0000 add 0.054 0.00

Benewah County Area, Hydrologic type C
Cald, Silt Loam
Infiltration Rate Calculation
SCS Permeability ('K') 1980
0.6 inches/hour peak
0.2 inches/hour min.
0.000423333 cm/sec, peak
0.000141111 cm/sec, min.
Check With Freeze & Cherry for this soil type:
0.00001 cm/sec, peak
0.000000001 cm/sec, min.
Utilize:
0.00001 cm/sec.
Assume sealing with human waste, 1 order of magnitude reduction:
0.000001 cm/sec.

Benewah County Area, Hydrologic type C
Lacy, Stony Loam
Infiltration Rate Calculation
SCS Permeability ('K') 1980
2 inches/hour peak
0.6 inches/hour min.
0.001411111 cm/sec, peak
0.000423333 cm/sec, min.
Check With Freeze & Cherry for this soil type:
0.001 cm/sec, peak
0.0000001 cm/sec, min.
Utilize:
0.000917222 cm/sec.
Assume sealing with human waste, 1 order of magnitude reduction:
9.17222E-05 cm/sec.

Wyatt Engineers Inc.
1220 N. Howard St.
Spokane, WA

Plummer Waste Water Treatment

Evaporative Lagoon Spreadsheet - Equalization Basin

27-Sep-02
Prepared by Alan E. Gay
Wyatt Engineering

length 700 width 600
9.641873 acres

Worst Case Monthly Overflow: 0 cf/day = 0 gpd out; = 0 gpm; = 0 cfs

count: 0
Average flow balance:
187235.9 gallons/day

Average Effluent Overflow: 0 cuft/mo 0 gallons/day
Area contributing runoff: -5.72 acres
Infiltration rate: 1.00E-09 cm/s = 8.6E-05 ft/month, with a an impermeable geomembrane liner 1.00E-10
Average operating depth after second year: 2.062845 feet
Initial Conditions: Ponds 1 -2 surface: 400668 square feet
Influent Flow: 188250 gpd = 25163.7 cf/day = 765397.3 cuft/mo
Assume Lagoon cells 1 initially full. Pond Vol: 8784 Assume System begins operation Jan. 1
Lagoon Surface Area: 423744 sq.ft.

Month Name	Year	Month	Rainfall (in/mo.)	Rain Vol. (cuft/mo)	Run-offV. (cuft/mo)	Evap Rate (in/mo.)	Influent (cuft/mo)	Initial Pond vol. (cuft)	Pond Surf. (sq.ft.)	Evap Vol. (cuft/mo)	Exfilt.Vol (cuft/mo)	Effl. Vol. (cuft/mo)	Depth/pond4 (ft.)	Max depth	
January	1	1	1.225265	43266.54	-20962.7	0.00	1016463.93	4392	1049.956	0.040237	0.09053	0	0	0	0
February	1	2	3.919403	138401.9	-76449.4	0.00	833500.42	8784	3744	0.028225	0.32281	0	0	0	0
March	1	3	3.11073	109846.1	-47012.4	1.02	992068.80	8784	3744	319.2482	0.32281	0	0	0	0
April	1	4	0.618382	21836.29	-1778.73	1.29	744051.60	8784	3744	403.8747	0.32281	0	0	0	0
May	1	5	3.46674	122417.5	-48268.5	3.72	658668.63	8784	3744	1161.286	0.32281	0	0	0	0
June	1	6	1.746241	61663.28	-17046.9	4.07	666800.34	392248	363886.4	123470	31.3745	0	0.992904593	0.9929046	0
July	1	7	2.948343	104111.9	-38449.6	5.49	707458.90	29331.38	356857.9	163315.4	30.7685	0	0.05320339	0.0532034	0
August	1	8	0.611894	21607.22	-1724.06	5.15	744051.60	639106.4	368667.3	158214	31.7867	0	1.632095912	1.6320959	0
September	1	9	0.316843	11188.38	-77.0959	3.30	654602.77	1244795	380397.5	104606.1	32.7981	0	3.200408472	3.2004085	0
October	1	10	0.258861	9140.912	-2.26493	1.01	711524.75	1792532	391005.4	32964.56	33.7127	0	4.618665065	4.6186651	0
November	1	11	2.655762	93780.27	-38132.4	0.98	699327.18	2371722	402222.4	32769.23	34.6798	0	6.118363465	6.1183635	0
December	1	12	4.161272	146942.8	-81455.8	0.00	756249.16	2903459	412520.4	6.913735	35.5677	0	7.495191712	7.4951917	0
January	2	13	3.421877	120833.3	-66156.2	0.00	1016463.93	8784	3744	0.143481	0.32281	0	0	0	0
February	2	14	6.402571	226087.6	-127889	0.00	833500.42	8784	3744	0.028225	0.32281	0	0	0	0
March	2	15	0	0	0	1.02	992068.80	8784	3744	319.2482	0.32281	0	0	0	0
April	2	16	3.150622	111254.8	-42253	1.29	744051.60	8784	3744	403.8747	0.32281	0	0	0	0
May	2	17	2.479079	87541.23	-29802.7	3.72	658668.63	8784	3744	1161.286	0.32281	0	0	0	0
June	2	18	1.175919	41524.07	-8267.12	4.07	666800.34	375837.5	363568.6	123362.1	31.3471	0	0.950412851	0.9504129	0
July	2	19	1.32485	46783.1	-10414.6	5.49	707458.90	8784	3744	1713.435	0.32281	0	0	0	0
August	2	20	0	0	0	5.15	744051.60	750897.6	370832.3	159143.1	31.9733	0	1.921557296	1.9215573	0
September	2	21	0.645445	22791.96	-2013.65	3.30	654602.77	1335774	382159.5	105090.6	32.95	0	3.435980058	3.4359801	0
October	2	22	3.965663	140035.5	-57903.7	1.01	711524.75	1892693	392945.2	33128.1	33.8799	0	4.878012551	4.8780126	0
November	2	23	4.01328	141717	-64948.3	0.98	699327.18	2544713	405572.7	33042.18	34.9687	0	6.56628838	6.5662884	0
December	2	24	6.455096	227942.3	-128978	0.00	756249.16	3097297	416274.4	6.976651	35.8914	0	7.997097112	7.9970971	0
January	3	25	5.060737	178704.8	-100083	0.00	1016463.93	8784	3744	0.143481	0.32281	0	0	0	0
February	3	26	0.245747	8677.818	-2130.34	0.00	833500.42	8784	3744	0.028225	0.32281	0	0	0	0
March	3	27	0	0	0	1.02	992068.80	8784	3744	319.2482	0.32281	0	0	0	0
April	3	28	0.333717	11784.2	-117.455	1.29	744051.60	8784	3744	403.8747	0.32281	0	0	0	0
May	3	29	4.468083	157776.9	-67738.8	3.72	658668.63	8784	3744	1161.286	0.32281	0	0	0	0
June	3	30	2.46366	86996.77	-29523.7	4.07	666800.34	408137.1	364194.2	123574.4	31.401	0	1.034046387	1.0340464	0
July	3	31	0.84854	29963.66	-4083.6	5.49	707458.90	57972.8	357412.6	163569.2	30.8163	0	0.127364722	0.1273647	0

Wyatt Engineers Inc.
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Spokane, WA

Plummer Waste Water Treatment

Evaporative Lagoon Spreadsheet - Equalization Basin

27-Sep-02
Prepared by Alan E. Gay
Wyatt Engineering

length	width	
6000	3000	
		413.2231 acres

Worst Case Monthly Overflow: 0 cf/day = 0 gpd out; = 0 gpm; = 0 cfs

count: 0
Average flow balance:
131983.3 gallons/day

Average Effluent Overflow: 0 cuft/mo 0 gallons/day
Area contributing runoff: 6.64 acres
Infiltration rate: 1.00E-09 cm/s = 8.6E-05 ft/month, with a an impermeable geomembrane liner 1.00E-10
Average operating depth after second year: 4.560987 feet
Initial Conditions: Ponds 1 -2 surface: 18000000 square feet
Influent Flow: 140750 gpd = 18814.3 cf/day = 572269.2 cuft/mo
Assume Lagoon cells 1 initially full. Pond Vol: 71568792 Assume System begins operation Jan. 1
Lagoon Surface Area: 18000000 sq.ft.

Month Name	Year	Month	Rainfall (in/mo.)	Rain Vol. (cuft/mo)	Run-offV. (cuft/mo)	Evap Rate (in/mo.)	Influent (cuft/mo)	Initial Pond vol. (cuft)	Pond Surf. (sq.ft.)	Evap Vol. (cuft/mo)	Exfilt.Vol (cuft/mo)	Effl. Vol. (cuft/mo)	Depth/pond4 (ft.)	Max depth	
January	1	1	1.379124	2068686	27981	0.00	813171.14	35784396	17892288	685.6836	1542.68	0	0	0	0
February	1	2	2.756508	4134762	60863.5	0.00	752183.31	71568792	18000000	135.6991	1551.97	0	0	0	0
March	1	3	1.719441	2579161	23832.2	1.02	788776.01	76514913	18000000	1534847	1551.97	0	0.276439333	0.2764393	0
April	1	4	3.133371	4700057	48693.3	1.29	540758.81	78370283	18000000	1941705	1551.97	0	0.380136209	0.3801362	0
May	1	5	2.985146	4477719	45454.8	3.72	455375.84	81716535	18000000	5583103	1551.97	0	0.56715864	0.5671586	0
June	1	6	0.583001	874502	1728.8	4.07	463507.55	81110429	18000000	6107563	1551.97	0	0.533283287	0.5332833	0
July	1	7	0.559458	839186.7	1517.62	5.49	504166.11	76341052	18000000	8237667	1551.97	0	0.266722231	0.2667222	0
August	1	8	0	0	0	5.15	540758.81	71568792	18000000	7724719	1551.97	0	0	0	0
September	1	9	0.077064	115595.3	654.345	3.30	451309.99	71568792	18000000	4949846	1551.97	0	0	0	0
October	1	10	2.184949	3277424	28508.6	1.01	508231.97	71568792	18000000	1517529	1551.97	0	0	0	0
November	1	11	4.768471	7152707	93091.9	0.98	496034.40	73863875	18000000	1466468	1551.97	0	0.128272499	0.1282725	0
December	1	12	3.268468	4902703	73148.4	0.00	552956.38	80137689	18000000	301.6753	1551.97	0	0.478916734	0.4789167	0
January	2	13	2.064537	3096806	44296.5	0.00	813171.14	85664643	18000000	689.8115	1551.97	0	0.787818887	0.7878189	0
February	2	14	3.06695	4600426	68310.9	0.00	752183.31	89616674	18000000	135.6991	1551.97	0	1.008698426	1.0086984	0
March	2	15	0.501531	752296.3	2160.33	1.02	788776.01	95035906	18000000	1534847	1551.97	0	1.311580002	1.31158	0
April	2	16	3.701122	5551683	61292.9	1.29	540758.81	95042740	18000000	1941705	1551.97	0	1.311961934	1.3119619	0
May	2	17	0	0	0	3.72	455375.84	99253217	18000000	5583103	1551.97	0	1.547286066	1.5472861	0
June	2	18	0.793169	1189753	4030.91	4.07	463507.55	94123938	18000000	6107563	1551.97	0	1.260609975	1.26061	0
July	2	19	1.489707	2234561	15009.5	5.49	504166.11	89672115	18000000	8237667	1551.97	0	1.011797016	1.011797	0
August	2	20	0.628644	942966.5	2167.74	5.15	540758.81	84186632	18000000	7724719	1551.97	0	0.705212689	0.7052127	0
September	2	21	1.94569	2918536	23689.1	3.30	451309.99	77946254	18000000	4949846	1551.97	0	0.356437163	0.3564372	0
October	2	22	4.282444	6423666	74434.9	1.01	508231.97	76388390	18000000	1517529	1551.97	0	0.269367964	0.269368	0
November	2	23	2.837167	4255751	48378.1	0.98	496034.40	81875642	18000000	1466468	1551.97	0	0.57605117	0.5760512	0
December	2	24	3.581655	5372482	80670.5	0.00	552956.38	85207786	18000000	301.6753	1551.97	0	0.762285115	0.7622851	0
January	3	25	2.641417	3962125	58104.3	0.00	813171.14	91212041	18000000	689.8115	1551.97	0	1.097863713	1.0978637	0
February	3	26	1.215662	1823492	24119.3	0.00	752183.31	96043200	18000000	135.6991	1551.97	0	1.367877799	1.3678778	0
March	3	27	1.500335	2250503	19305.4	1.02	788776.01	98641308	18000000	1534847	1551.97	0	1.513086349	1.5130863	0
April	3	28	1.937637	2906456	23529.6	1.29	540758.81	1E+08	18000000	1941705	1551.97	0	1.598161484	1.5981615	0
May	3	29	0	0	0	3.72	455375.84	1.02E+08	18000000	5583103	1551.97	0	1.683532936	1.6835329	0
June	3	30	1.877683	2816525	22348	4.07	463507.55	96561700	18000000	6107563	1551.97	0	1.396856845	1.3968568	0
July	3	31	3.391045	5086567	54376.9	5.49	504166.11	93754966	18000000	8237667	1551.97	0	1.239988119	1.2399881	0

Wyatt Engineering, Inc.
1220 N. Howard Street
Spokane, WA

Plummer Waste Water Treatment

27-Sep-02
Prepared by Alan E. Gay
Wyatt Engineering

Influent Flow Calculation:

from Influent average flow data, 1999 - 2002

January	200000	gpd	813171.1	cu ft/mo
February	185000	gpd	752183.3	cu ft/mo
March	194000	gpd	788776	cu ft/mo
April	133000	gpd	540758.8	cu ft/mo
May	112000	gpd	455375.8	cu ft/mo
June	114000	gpd	463507.6	cu ft/mo
July	124000	gpd	504166.1	cu ft/mo
August	133000	gpd	540758.8	cu ft/mo
September	111000	gpd	451310	cu ft/mo
October	125000	gpd	508232	cu ft/mo
November	122000	gpd	496034.4	cu ft/mo
December	136000	gpd	552956.4	cu ft/mo
	140750	gpd	572269.2	cu ft/mo

			0.054
July	2000	0.061	0.007
August	2000	0.06	0.006
September	2000	0.065	0.011
October	2000	0.04	-0.014
November	2000	0.057	0.003
November	2001	0.037	-0.017
December	2001	0.049	-0.005
January	2002	0.071	0.017
February	2002	0.107	0.053
March	2002	0.09	0.036
April	2002	0.097	0.043
May	2002	0.062	0.008
		0.066	0.012

#NAME?

Run-off volume: (based on hydrologic soil group c)
Hydrologic Soil Group: C

From Western Regional Climate Center
average Bayview

0.768045

	SCS CN	S	description	Precipitation	50-year dry	50-yr wet	Qavg		Q 50-yr dry	Q 50-yr we	random precip	random #	random runoff, Q
Jan.	98	0.204082	frozen ground	2.86	1.2	4.75	2.628878309	in.	0.985653183	4.513579	2.717609	0.431988	2.487367019
Feb.	98	0.204082	frozen ground	2.27	0.39	5.92	2.042218675	in.	0.220381138	5.681949	3.138131	0.822138	2.905849179
Mar.	92	0.869565	saturated	2.06	0.47	5.23	1.290919094	in.	0.075208958	4.314127	1.447743	0.22061	0.757042868
Apr.	89	1.235955	gravel	1.75	0.63	4.12	0.824618266	in.	0.090527537	2.935867	1.363403	0.244986	0.529694116
May	89	1.235955	gravel	2.06	0.66	5.57	1.077904482	in.	0.103356973	4.319761	2.320393	0.64505	1.298870599
June	89	1.235955	gravel	1.82	0.86	4.23	0.880717666	in.	0.203127521	3.039564	2.135602	0.744571	1.141381928
July	89	1.235955	gravel	1.02	0.05	1.95	0.29731403	in.	0.037433231	0.986659	0.468251	0.127638	0.033539338
Aug.	89	1.235955	gravel	1.08	0	3.29	0.335258539	in.	0	2.163869	1.839329	0.920163	0.896329726
Sep.	89	1.235955	gravel	1.21	0	3.14	0.421601013	in.	0	2.02684	1.33491	0.581785	0.509164314
Oct.	89	1.235955	gravel	2.07	0.47	4.6	1.086266401	in.	0.034031443	3.390185	1.214631	0.142488	0.424771925
Nov.	92	0.869565	saturated	2.92	1.81	7.94	2.085652383	in.	1.068296932	6.984082	2.702111	0.34731	1.881173914
Dec.	98	0.204082	frozen ground	3.22	1.86	7.75	2.98741243	in.	1.635687237	7.510365	2.29762	0.087479	2.069646777
total				24.33	20	43.72							
sum				24.34	8.4	58.49	15.95876129		4.453704154	47.86685	22.97993		14.9348317

Average of Sandpoint and Moscow, from Western Region Climate Center

Average Annual Evaporation:				Evaporative Index Parameters											
	Monthly Evaporation:			Pan Evap	AvgTemp	Pressure	Dew Pt.	wind	Corr Factor	Est. evap					
	Jan	0.00	inches	0.01	24.3	28.1896333	23	9.3	0.39088141	0.000459874					0.3
	Feb	0.00	inches	0.02	29	28.1896333	25	9.7	0.405386503	9.04661E-05					0.5
	Mar	1.02	inches	1.52	37.8	28.1896333	28	10.5	0.427801023	1.023231369					1.3
	Apr	1.29	inches	1.93	46.7	28.1896333	34	10.7	0.466558154	1.294470315					5.27
	May	3.72	inches	5.41	54.5	28.1896333	40	9.9	0.500823369	3.722068971					7.62
	Jun	4.07	inches	5.91	59.9	28.1896333	46	9.5	0.536133325	4.071708535					8.71
	Jul	5.49	inches	7.97	67.4	28.1896333	47	8.7	0.538722433	5.491778132					10.42
	Aug	5.15	inches	7.47	65.6	28.1896333	47	8.5	0.537809877	5.149812762					9.29
	Sep	3.30	inches	4.82	58.8	28.1896333	40	8.6	0.495157233	3.299897551					5.94
	Oct	1.01	inches	1.52	47.6	28.1896333	34	8.8	0.458544822	1.011686101					2.3
	Nov	0.98	inches	1.43	34.6	28.1896333	29	9.4	0.429580585	0.9776451					0.6
	Dec	0.00	inches	0.03	28.5	28.1896333	24	9	0.395966369	0.000201117					0.3
		26.04		38.04											
															52.54

Existing Pond Volumes
Cell 1 - Mechanical Plant

depth area volume length width

Regression Output:

Regression Output:

Regression Output:

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Spokane, WA

Plummer Waste Water Treatment

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Wyatt Engineering

											0.054		
	0	17784576	0	5976	2976	Constant		17784576	Constant		0	Constant	
	1	17838324	17811450	5982	2982	Std Err of Y Est		93.92	Std Err of Y Est		0.040364	Std Err of Y Est	
	2	17892144	35676684	5988	2988	R Squared		1.00	R Squared		0.999404	R Squared	
	3	17946036	53595774	5994	2994	No. of Observations		5.00	No. of Observations		5	No. of Observations	
	4	18000000	71568792	6000	3000	Degrees of Freedom		3	Degrees of Freedom		3	Degrees of Freedom	
top		18279756		6021	3036	X Coefficient(s)	53856		X Coefficient(s)	5.58901E-08		X Coefficient(s)	0.003010023
						Std Err of Coef.	32.79894971		Std Err of Coef.	1.35455E-07		Std Err of Coef.	0.000396573
		761930.2232				to obtain area from depth:			to obtain depth from volume:			to obtain area from volume:	
						enter depth, multiply by	53856		enter vol., multiply by	5.58901E-08		enter vol., multiply by	0.003010023
						add	17784576.00		add	0.0000		add	17784576.00
Cell 2 - Equalization Basin													
depth		area	volume	length	width	Regression Output:			Regression Output:			Regression Output:	
	0	0	0	0	0	Constant		0	Constant		0	Constant	
	0	0	0	0	0	Std Err of Y Est		94.94187	Std Err of Y Est		0.034974	Std Err of Y Est	
	0	0	0	0	0	R Squared		0.999817	R Squared		0.999552	R Squared	
	0	0	0	0	0	No. of Observations		5	No. of Observations		5	No. of Observations	
	0	0	0	0	0	Degrees of Freedom		3	Degrees of Freedom		3	Degrees of Freedom	
	0	0	0	0	0								
	0	0	0	0	0								
top		9396		261	36	X Coefficient(s)	#NUM!		X Coefficient(s)	#NUM!		X Coefficient(s)	#NUM!
						Std Err of Coef.	33.15513776		Std Err of Coef.	1.25791E-07		Std Err of Coef.	0.00020634
		521320.6791				to obtain area from depth:			to obtain depth from volume:			to obtain area from volume:	
						enter depth, multiply by	#NUM!		enter vol., multiply by	#NUM!		enter vol., multiply by	#NUM!
						add	0.00		add	0.0000		add	0.00
Cell 3 -													
depth		area	volume	length	width	Regression Output:			Regression Output:			Regression Output:	
	0	0	0	0	0	Constant		#NUM!	Constant		#NUM!	Constant	
	0	0	0	0	0	Std Err of Y Est		14.40846	Std Err of Y Est		0.00402	Std Err of Y Est	
	0	0	0	0	0	R Squared		0.999999	R Squared		0.999994	R Squared	
	0	0	0	0	0	No. of Observations		5	No. of Observations		5	No. of Observations	
	0	0	0	0	0	Degrees of Freedom		3	Degrees of Freedom		3	Degrees of Freedom	
	0	0	0	0	0								
top:		0				X Coefficient(s)	#NUM!		X Coefficient(s)	#NUM!		X Coefficient(s)	#NUM!
		0				Std Err of Coef.	5.03165175		Std Err of Coef.	9.44024E-10		Std Err of Coef.	3.66713E-06
		9412.734483				to obtain area from depth:			to obtain depth from volume:			to obtain area from volume:	
						enter depth, multiply by	#NUM!		enter vol., multiply by	#NUM!		enter vol., multiply by	#NUM!
						add	#NUM!		add	#NUM!		add	#NUM!
Cell 4 & 5													
depth		area	volume	length	width	area Regression Output:			Regression Output:			area fr. vol Regression Output:	
	0	0	0	0	0	Constant		0	Constant		0	Constant	
	0	0	0	0	0	Std Err of Y Est		19.44222	Std Err of Y Est		0.065676	Std Err of Y Est	
	0	0	0	0	0	R Squared		0.999837	R Squared		0.998706	R Squared	
	0	0	0	0	0	No. of Observations		5	No. of Observations		5	No. of Observations	
	0	0	0	0	0	Degrees of Freedom		3	Degrees of Freedom		3	Degrees of Freedom	
						X Coefficient(s)	#NUM!		X Coefficient(s)	#NUM!		X Coefficient(s)	#NUM!
						Std Err of Coef.	6.14817046		Std Err of Coef.	1.51412E-06		Std Err of Coef.	0.000814853
						to obtain area from depth:			to obtain depth from volume:			to obtain area from volume:	
						enter depth, multiply by	#NUM!		enter vol., multiply by	#NUM!		enter vol., multiply by	#NUM!

Wyatt Engineering, Inc.
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Plummer Waste Water Treatment

27-Sep-02
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add 0.00 add 0.0000 add 0.054 0.00

Benewah County Area, Hydrologic type C
Cald, Silt Loam
Infiltration Rate Calculation
SCS Permeability ('K') 1980
0.6 inches/hour peak
0.2 inches/hour min.
0.000423333 cm/sec, peak
0.000141111 cm/sec, min.
Check With Freeze & Cherry for this soil type:
0.00001 cm/sec, peak
0.000000001 cm/sec, min.
Utilize:
0.00001 cm/sec.
Assume sealing with human waste, 1 order of magnitude reduction:
0.000001 cm/sec.

Benewah County Area, Hydrologic type C
Lacy, Stony Loam
Infiltration Rate Calculation
SCS Permeability ('K') 1980
2 inches/hour peak
0.6 inches/hour min.
0.001411111 cm/sec, peak
0.000423333 cm/sec, min.
Check With Freeze & Cherry for this soil type:
0.001 cm/sec, peak
0.0000001 cm/sec, min.
Utilize:
0.000917222 cm/sec.
Assume sealing with human waste, 1 order of magnitude reduction:
9.17222E-05 cm/sec.

Wyatt Engineering, Inc.
1220 N. Howard Street
Spokane, WA

Plummer Waste Water Treatment

27-Sep-02
Prepared by Alan E. Gay
Wyatt Engineering

Influent Flow Calculation:

from Influent average flow data, 1999 - 2002

January	250000	gpd	1016464	cu ft/mo
February	205000	gpd	833500.4	cu ft/mo
March	244000	gpd	992068.8	cu ft/mo
April	183000	gpd	744051.6	cu ft/mo
May	162000	gpd	658668.6	cu ft/mo
June	164000	gpd	666800.3	cu ft/mo
July	174000	gpd	707458.9	cu ft/mo
August	183000	gpd	744051.6	cu ft/mo
September	161000	gpd	654602.8	cu ft/mo
October	175000	gpd	711524.8	cu ft/mo
November	172000	gpd	699327.2	cu ft/mo
December	186000	gpd	756249.2	cu ft/mo
	188250	gpd	765397.3	cu ft/mo

			0.054
July	2000	0.061	0.007
August	2000	0.06	0.006
September	2000	0.065	0.011
October	2000	0.04	-0.014
November	2000	0.057	0.003
November	2001	0.037	-0.017
December	2001	0.049	-0.005
January	2002	0.071	0.017
February	2002	0.107	0.053
March	2002	0.09	0.036
April	2002	0.097	0.043
May	2002	0.062	0.008
		0.066	0.012

#NAME?

Run-off volume: (based on hydrologic soil group c)
Hydrologic Soil Group: C

From Western Regional Climate Center
average Bayview

0.701965

	SCS CN	S	description	Precipitation	50-year dry	50-yr wet	Qavg		Q 50-yr dry	Q 50-yr we	random precip	random #	random runoff, Q
Jan.	98	0.204082	frozen ground	2.86	1.2	4.75	2.628878309	in.	0.985653183	4.513579	1.504061	0.051165	1.28414256
Feb.	98	0.204082	frozen ground	2.27	0.39	5.92	2.042218675	in.	0.220381138	5.681949	0.145186	0.011897	0.035315485
Mar.	92	0.869565	saturated	2.06	0.47	5.23	1.290919094	in.	0.075208958	4.314127	2.242441	0.590755	1.456321701
Apr.	89	1.235955	gravel	1.75	0.63	4.12	0.824618266	in.	0.090527537	2.935867	1.425724	0.281273	0.575252541
May	89	1.235955	gravel	2.06	0.66	5.57	1.077904482	in.	0.103356973	4.319761	2.213911	0.587015	1.207736346
June	89	1.235955	gravel	1.82	0.86	4.23	0.880717666	in.	0.203127521	3.039564	1.734637	0.429424	0.812401394
July	89	1.235955	gravel	1.02	0.05	1.95	0.29731403	in.	0.037433231	0.986659	0.41822	0.107343	0.020789888
Aug.	89	1.235955	gravel	1.08	0	3.29	0.335258539	in.	0	2.163869	1.099217	0.514194	0.347679264
Sep.	89	1.235955	gravel	1.21	0	3.14	0.421601013	in.	0	2.02684	0.694211	0.196956	0.118734132
Oct.	89	1.235955	gravel	2.07	0.47	4.6	1.086266401	in.	0.034031443	3.390185	0.916306	0.074635	0.23501227
Nov.	92	0.869565	saturated	2.92	1.81	7.94	2.085652383	in.	1.068296932	6.984082	2.558473	0.257394	1.747359099
Dec.	98	0.204082	frozen ground	3.22	1.86	7.75	2.98741243	in.	1.635687237	7.510365	1.870874	0.023628	1.646451666
total				24.33	20	43.72							
sum				24.34	8.4	58.49	15.95876129		4.453704154	47.86685	16.82326		9.487196347

Average of Sandpoint and Moscow, from Western Region Climate Center

Average Annual Evaporation:				Evaporative Index Parameters							
	Monthly Evaporation:			Pan Evap	AvgTemp	Pressure	Dew Pt.	wind	Corr Factor	Est. evap	
	Jan	0.00	inches	0.01	24.3	28.1896333	23	9.3	0.39088141	0.000459874	0.3
	Feb	0.00	inches	0.02	29	28.1896333	25	9.7	0.405386503	9.04661E-05	0.5
	Mar	1.02	inches	1.52	37.8	28.1896333	28	10.5	0.427801023	1.023231369	1.3
	Apr	1.29	inches	1.93	46.7	28.1896333	34	10.7	0.466558154	1.294470315	5.27
	May	3.72	inches	5.41	54.5	28.1896333	40	9.9	0.500823369	3.722068971	7.62
	Jun	4.07	inches	5.91	59.9	28.1896333	46	9.5	0.536133325	4.071708535	8.71
	Jul	5.49	inches	7.97	67.4	28.1896333	47	8.7	0.538722433	5.491778132	10.42
	Aug	5.15	inches	7.47	65.6	28.1896333	47	8.5	0.537809877	5.149812762	9.29
	Sep	3.30	inches	4.82	58.8	28.1896333	40	8.6	0.495157233	3.299897551	5.94
	Oct	1.01	inches	1.52	47.6	28.1896333	34	8.8	0.458544822	1.011686101	2.3
	Nov	0.98	inches	1.43	34.6	28.1896333	29	9.4	0.429580585	0.9776451	0.6
	Dec	0.00	inches	0.03	28.5	28.1896333	24	9	0.395966369	0.000201117	0.3
		26.04		38.04							
											52.54

Existing Pond Volumes
Cell 1 - Mechanical Plant

depth	area	volume	length	width

Regression Output:

Regression Output:

Regression Output:

Wyatt Engineering, Inc.
1220 N. Howard Street
Spokane, WA

Plummer Waste Water Treatment

27-Sep-02
Prepared by Alan E. Gay
Wyatt Engineering

	0	-792	0	24
	2	-756	-1548	36
	8	1080	-576	72
	10	2268	2772	84
	12	3744	6784	96
top		8775		117
		761930.2232		

-33	Constant	
-21	Std Err of Y Est	
15	R Squared	
27	No. of Observations	
39	Degrees of Freedom	
75	X Coefficient(s)	366.1791045
	Std Err of Coef.	32.79894971
	to obtain area from depth:	
	enter depth, multiply by	366.1791045
	add	-792.00

-792	Constant	
93.92	Std Err of Y Est	
1.00	R Squared	
5.00	No. of Observations	
3	Degrees of Freedom	
	X Coefficient(s)	0.000932371
	Std Err of Coef.	1.35455E-07
	to obtain depth from volume:	
	enter vol., multiply by	0.000932371
	add	0.0000

0.054		
0	Constant	
0.040364	Std Err of Y Est	
0.999404	R Squared	
5	No. of Observations	
3	Degrees of Freedom	
	X Coefficient(s)	0.419388869
	Std Err of Coef.	0.000396573
	to obtain area from volume:	
	enter vol., multiply by	0.419388869
	add	-792.00

Cell 2 -Leaky Wetland

depth	area	volume	length	width
0	262544	0	536	488
0.25	264085.25	65828.66	539.5	489.5
0.5	265631	132043.2	541	491
0.75	267181.25	198644.7	542.5	492.5
1	268736	265634.4	544	494
1.5	271859	400783.1	547	497
2	275000	537497.9	550	500
top	139896		261	536
	521320.6791			

Regression Output:

488	Constant	
489.5	Std Err of Y Est	
491	R Squared	
492.5	No. of Observations	
494	Degrees of Freedom	
497		
500		
536	X Coefficient(s)	6228.107784
	Std Err of Coef.	33.15513776
	to obtain area from depth:	
	enter depth, multiply by	6228.107784
	add	262544.00

Regression Output:

262544	Constant	
94.94187	Std Err of Y Est	
0.999817	R Squared	
5	No. of Observations	
3	Degrees of Freedom	
	X Coefficient(s)	3.72067E-06
	Std Err of Coef.	1.25791E-07
	to obtain depth from volume:	
	enter vol., multiply by	3.72067E-06
	add	0.0000

Regression Output:

0	Constant	
0.034974	Std Err of Y Est	
0.999552	R Squared	
5	No. of Observations	
3	Degrees of Freedom	
	X Coefficient(s)	0.023173302
	Std Err of Coef.	0.00020634
	to obtain area from volume:	
	enter vol., multiply by	0.023173302
	add	262544.00

Cell 3 -

depth	area	volume	length	width
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
top:		0		
		0		
		9412.734483		

Regression Output:

0	Constant	
0	Std Err of Y Est	
0	R Squared	
0	No. of Observations	
0	Degrees of Freedom	
0		
	X Coefficient(s)	#NUM!
	Std Err of Coef.	5.03165175
	to obtain area from depth:	
	enter depth, multiply by	#NUM!
	add	#NUM!

Regression Output:

#NUM!	Constant	
14.40846	Std Err of Y Est	
0.999999	R Squared	
5	No. of Observations	
3	Degrees of Freedom	
	X Coefficient(s)	#NUM!
	Std Err of Coef.	9.44024E-10
	to obtain depth from volume:	
	enter vol., multiply by	#NUM!
	add	#NUM!

Regression Output:

#NUM!	Constant	
0.00402	Std Err of Y Est	
0.999994	R Squared	
5	No. of Observations	
3	Degrees of Freedom	
	X Coefficient(s)	#NUM!
	Std Err of Coef.	3.66713E-06
	to obtain area from volume:	
	enter vol., multiply by	#NUM!
	add	#NUM!

Cell 4 & 5

depth	area	volume	length	width
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

area Regression Output:

0	Constant	
0	Std Err of Y Est	
0	R Squared	
0	No. of Observations	
0	Degrees of Freedom	
	X Coefficient(s)	#NUM!
	Std Err of Coef.	6.14817046
	to obtain area from depth:	
	enter depth, multiply by	#NUM!

Regression Output:

0	Constant	
19.44222	Std Err of Y Est	
0.999837	R Squared	
5	No. of Observations	
3	Degrees of Freedom	
	X Coefficient(s)	#NUM!
	Std Err of Coef.	1.51412E-06
	to obtain depth from volume:	
	enter vol., multiply by	#NUM!

area fr. vol Regression Output:

0	Constant	
0.065676	Std Err of Y Est	
0.998706	R Squared	
5	No. of Observations	
3	Degrees of Freedom	
	X Coefficient(s)	#NUM!
	Std Err of Coef.	0.000814853
	to obtain area from volume:	
	enter vol., multiply by	#NUM!

Wyatt Engineering, Inc.
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Spokane, WA

Plummer Waste Water Treatment

27-Sep-02
Prepared by Alan E. Gay
Wyatt Engineering

add 0.00 add 0.0000 0.054 add 0.00

Benewah County Area, Hydrologic type C
Cald, Silt Loam
Infiltration Rate Calculation
SCS Permeability ('K') 1980
0.6 inches/hour peak
0.2 inches/hour min.
0.000423333 cm/sec, peak
0.000141111 cm/sec, min.
Check With Freeze & Cherry for this soil type:
0.00001 cm/sec, peak
0.000000001 cm/sec, min.
Utilize:
0.00001 cm/sec.
Assume sealing with human waste, 1 order of magnitude reduction:
0.000001 cm/sec.

Benewah County Area, Hydrologic type C
Lacy, Stony Loam
Infiltration Rate Calculation
SCS Permeability ('K') 1980
2 inches/hour peak
0.6 inches/hour min.
0.001411111 cm/sec, peak
0.000423333 cm/sec, min.
Check With Freeze & Cherry for this soil type:
0.001 cm/sec, peak
0.0000001 cm/sec, min.
Utilize:
0.000917222 cm/sec.
Assume sealing with human waste, 1 order of magnitude reduction:
9.17222E-05 cm/sec.

Wyatt Engineers Inc.
1220 N. Howard St.
Spokane, WA

Plummer Waste Water Treatment

Evaporative Lagoon Spreadsheet - Equalization Basin

27-Sep-02
Prepared by Alan E. Gay
Wyatt Engineering

length 550 width 500
6.313131 acres

Worst Case Monthly Overflow: 0 cf/day = 0 gpd out
= 0 gpm
= 0 cfs

count: 0
Average flow balance:
159575.3 gallons/day

Average Effluent Overflow: 0 cuft/mo 0 gallons/day
Area contributing runoff: -2.99 acres
Infiltration rate: 1.00E-05 cm/s = 0.8622 ft/month, with a an impermeable geomembrane liner 1.00E-06
Average operating depth after second year: 2.377005 feet
Initial Conditions: Ponds 1 -2 surface: 272480 square feet
Influent Flow: 188250 gpd = 25163.7 cf/day = 765397.3 cuft/mo
Assume Lagoon cells 1 initially full. Pond Vol: 8784 Assume System begins operation Jan. 1
Lagoon Surface Area: 278744 sq.ft.

Month Name	Year	Month	Rainfall (in/mo.)	Rain Vol. (cuft/mo)	Run-offV. (cuft/mo)	Evap Rate (in/mo.)	Influent (cuft/mo)	Initial Pond vol. (cuft)	Pond Surf. (sq.ft.)	Evap Vol. (cuft/mo)	Exfilt.Vol (cuft/mo)	Effl. Vol. (cuft/mo)	Depth/pond4 (ft.)	Max depth	
January	1	1	4.421652	102709.1	-45372	0.00	1016463.93	4392	1049.956	0.040237	905.277	0	0	0	0
February	1	2	0	0	0	0.00	833500.42	8784	3744	0.028225	3228.09	0	0	0	0
March	1	3	0.310896	7221.69	-202.07	1.02	992068.80	8784	3744	319.2482	3228.09	0	0	0	0
April	1	4	1.600471	37176.8	-7666.72	1.29	744051.60	8784	3744	403.8747	3228.09	0	0	0	0
May	1	5	0.745437	17315.5	-1551.65	3.72	658668.63	8784	3744	1161.286	3228.09	0	0	0	0
June	1	6	2.652205	61607.19	-17219.6	4.07	666800.34	330635.1	273746.4	92884.61	236025	0	1.197502858	1.1975029	0
July	1	7	1.592594	36993.83	-7600.85	5.49	707458.90	8784	3744	1713.435	3228.09	0	0	0	0
August	1	8	2.796799	64965.91	-18613.2	5.15	744051.60	740694.3	278744	119623.3	240334	0	2.723199421	2.7231994	0
September	1	9	1.629572	37852.79	-7911.09	3.30	654602.77	1171141	278744	76652.22	240334	0	4.324750587	4.3247506	0
October	1	10	2.296282	53339.58	-13854.4	1.01	711524.75	1525360	278744	23500.12	240334	0	5.64268543	5.6426854	0
November	1	11	5.167628	120037.1	-46101.3	0.98	699327.18	1904061	278744	22709.39	240334	0	7.051705363	7.0517054	0
December	1	12	3.764987	87455.62	-38270.6	0.00	756249.16	2223846	278744	4.671677	240334	0	8.241520965	8.241521	0
January	2	13	3.890706	90375.92	-39629.8	0.00	1016463.93	8784	3744	0.143481	3228.09	0	0	0	0
February	2	14	3.607325	83793.35	-36566.5	0.00	833500.42	8784	3744	0.028225	3228.09	0	0	0	0
March	2	15	2.195221	50992.05	-15319.4	1.02	992068.80	8784	3744	319.2482	3228.09	0	0	0	0
April	2	16	1.793578	41662.44	-9316.05	1.29	744051.60	8784	3744	403.8747	3228.09	0	0	0	0
May	2	17	0.410392	9532.863	-206.341	3.72	658668.63	8784	3744	1161.286	3228.09	0	0	0	0
June	2	18	1.177133	27343.23	-4327.93	4.07	666800.34	324197.8	273597.2	92834	235897	0	1.173551648	1.1735516	0
July	2	19	1.217447	28279.68	-4625.21	5.49	707458.90	8784	3744	1713.435	3228.09	0	0	0	0
August	2	20	1.849194	42954.3	-9802.26	5.15	744051.60	734955.8	278744	119623.3	240334	0	2.701848288	2.7018483	0
September	2	21	0.132726	3083.053	-126.635	3.30	654602.77	1152202	278744	76652.22	240334	0	4.254284254	4.2542843	0
October	2	22	1.236601	28724.59	-4768.23	1.01	711524.75	1479436	278744	23500.12	240334	0	5.471815657	5.4718157	0
November	2	23	3.08876	71747.77	-24335.4	0.98	699327.18	1842607	278744	22709.39	240334	0	6.823057855	6.8230579	0
December	2	24	1.507661	35020.96	-13957.8	0.00	756249.16	2135869	278744	4.671677	240334	0	7.91418815	7.9141882	0
January	3	25	3.35616	77959.13	-33852.5	0.00	1016463.93	8784	3744	0.143481	3228.09	0	0	0	0
February	3	26	2.599663	60386.71	-25687.7	0.00	833500.42	8784	3744	0.028225	3228.09	0	0	0	0
March	3	27	0.942272	21887.73	-3906.97	1.02	992068.80	8784	3744	319.2482	3228.09	0	0	0	0
April	3	28	1.548323	35965.48	-7232.91	1.29	744051.60	8784	3744	403.8747	3228.09	0	0	0	0
May	3	29	5.449148	126576.5	-45561.1	3.72	658668.63	8784	3744	1161.286	3228.09	0	0	0	0
June	3	30	0.89672	20829.62	-2425.38	4.07	666800.34	395886.6	275258.4	93397.68	237329	0	1.440282288	1.4402823	0
July	3	31	0	0	0	5.49	707458.90	8784	3744	1713.435	3228.09	0	0	0	0

Wyatt Engineers Inc.
1220 N. Howard St.
Spokane, WA

Plummer Waste Water Treatment

Evaporative Lagoon Spreadsheet - Equalization Basin

27-Sep-02
Prepared by Alan E. Gay
Wyatt Engineering

length 400 width 350
3.213958 acres

Worst Case Monthly Overflow: 0 cf/day = 0 gpd out
= 0 gpm
= 0 cfs

count: 0
Average flow balance:
187979 gallons/day

Average Effluent Overflow: 0 cuft/mo 0 gallons/day
Area contributing runoff: -0.79 acres
Infiltration rate: 1.00E-09 cm/s = 8.6E-05 ft/month, with a an impermeable geomembrane liner 1.00E-10
Average operating depth after second year: 4.38704 feet
Initial Conditions: Ponds 1 -2 surface: 130568 square feet
Influent Flow: 188250 gpd = 25163.7 cf/day = 765397.3 cuft/mo
Assume Lagoon cells 1 initially full. Pond Vol: 8784 Assume System begins operation Jan. 1
Lagoon Surface Area: 143744 sq.ft.

Month Name	Year	Month	Rainfall (in/mo.)	Rain Vol. (cuft/mo)	Run-offV. (cuft/mo)	Evap Rate (in/mo.)	Influent (cuft/mo)	Initial Pond vol. (cuft)	Pond Surf. (sq.ft.)	Evap Vol. (cuft/mo)	Exfilt.Vol (cuft/mo)	Effl. Vol. (cuft/mo)	Depth/pond4 (ft.)	Max depth	
January	1	1	4.173413	49991.92	-11231.2	0.00	1016463.93	4392	1049.956	0.040237	0.09053	0	0	0	0
February	1	2	2.230028	26712.76	-5711.06	0.00	833500.42	296272.5	116095.6	0.875226	10.0098	0	2.376395544	2.3763955	0
March	1	3	1.707331	20451.55	-2790.66	1.02	992068.80	387419.8	119245.7	10167.99	10.2814	0	3.129823517	3.1298235	0
April	1	4	2.520634	30193.83	-4200.22	1.29	744051.60	623627.2	127409	13743.93	10.9853	0	5.082326568	5.0823266	0
May	1	5	0.52199	6252.743	-142.552	3.72	658668.63	616573.5	127165.2	39443.15	10.9642	0	5.0240202	5.0240202	0
June	1	6	2.148939	25741.43	-3287.24	4.07	666800.34	478554.2	122395.3	41529.83	10.553	0	3.883145344	3.8831453	0
July	1	7	0.743402	8904.963	-405.396	5.49	707458.90	362924.3	118399.1	54185.14	10.2084	0	2.927342846	2.9273428	0
August	1	8	0.912047	10925.1	-663.213	5.15	744051.60	261343.4	114888.5	49304.51	9.90574	0	2.087669847	2.0876698	0
September	1	9	2.510563	30073.2	-4175.07	3.30	654602.77	202998.5	112872.1	31038.85	9.73188	0	1.605387582	1.6053876	0
October	1	10	1.07546	12882.58	-947.814	1.01	711524.75	89106.83	108936	9184.083	9.39251	0	0.663952788	0.6639528	0
November	1	11	2.814371	33712.41	-5664.81	0.98	699327.18	40028.87	107239.8	8736.874	9.24627	0	0.258271775	0.2582718	0
December	1	12	2.977704	35668.93	-7831.55	0.00	756249.16	8784	3744	0.062748	0.32281	0	0	0	0
January	2	13	2.261787	27093.2	-5800.98	0.00	1016463.93	29526.15	106876.9	4.095827	9.21497	0	0.171455744	0.1714557	0
February	2	14	3.563331	42683.95	-9495.77	0.00	833500.42	303925	116360.1	0.87722	10.0326	0	2.439651127	2.4396511	0
March	2	15	3.155096	37793.85	-6582.17	1.02	992068.80	407258.7	119931.3	10226.46	10.3405	0	3.293812956	3.293813	0
April	2	16	0.885573	10607.99	-620.084	1.29	744051.60	656958.4	128560.9	13868.19	11.0846	0	5.35784379	5.3578438	0
May	2	17	4.307762	51601.25	-8878.1	3.72	658668.63	633774.6	127759.7	39627.54	11.0155	0	5.166205429	5.1662054	0
June	2	18	0.160671	1924.628	-18.573	4.07	666800.34	532183.8	124248.7	42158.72	10.7128	0	4.326450666	4.3264507	0
July	2	19	0.275024	3294.427	-1.74823	5.49	707458.90	395376.8	119520.7	54698.42	10.3051	0	3.195596409	3.1955964	0
August	2	20	5.465412	65468.35	-12032.1	5.15	744051.60	288075.6	115812.3	49700.99	9.98539	0	2.308639406	2.3086394	0
September	2	21	3.46478	41503.45	-6629.67	3.30	654602.77	272508.5	115274.3	31699.46	9.93901	0	2.179960794	2.1799608	0
October	2	22	3.461036	41458.59	-6619.82	1.01	711524.75	166931.6	111625.6	9410.838	9.62441	0	1.307256889	1.3072569	0
November	2	23	2.891155	34632.18	-5870.64	0.98	699327.18	140530.7	110713.2	9019.849	9.54574	0	1.089025338	1.0890253	0
December	2	24	4.997005	59857.45	-13575.6	0.00	756249.16	96246.04	109182.7	1.829874	9.41378	0	0.722965907	0.7229659	0
January	3	25	3.394523	40661.86	-9015.86	0.00	1016463.93	135421.8	110536.6	4.236079	9.53052	0	1.046794683	1.0467947	0
February	3	26	4.222743	50582.83	-11371.6	0.00	833500.42	420174	120377.7	0.907508	10.379	0	3.400571308	3.4005713	0
March	3	27	0.892653	10692.79	-927.569	1.02	992068.80	529530.4	124157	10586.78	10.7049	0	4.304517144	4.3045171	0
April	3	28	4.060771	48642.63	-8213.93	1.29	744051.60	757422.9	132033	14242.73	11.3839	0	6.188288967	6.188289	0
May	3	29	1.052479	12607.29	-906.033	3.72	658668.63	764305.1	132270.9	41026.77	11.4045	0	6.245177365	6.2451774	0
June	3	30	2.243094	26869.28	-3515.31	4.07	666800.34	630292.8	127639.4	43309.2	11.0051	0	5.137424628	5.1374246	0
July	3	31	0.067094	803.6997	-87.6078	5.49	707458.90	513782.9	123612.8	56571.17	10.658	0	4.17434762	4.1743476	0

Wyatt Engineering, Inc.
1220 N. Howard Street
Spokane, WA

Plummer Waste Water Treatment

27-Sep-02
Prepared by Alan E. Gay
Wyatt Engineering

Influent Flow Calculation:

from Influent average flow data, 1999 - 2002

January	250000	gpd	1016464	cu ft/mo
February	205000	gpd	833500.4	cu ft/mo
March	244000	gpd	992068.8	cu ft/mo
April	183000	gpd	744051.6	cu ft/mo
May	162000	gpd	658668.6	cu ft/mo
June	164000	gpd	666800.3	cu ft/mo
July	174000	gpd	707458.9	cu ft/mo
August	183000	gpd	744051.6	cu ft/mo
September	161000	gpd	654602.8	cu ft/mo
October	175000	gpd	711524.8	cu ft/mo
November	172000	gpd	699327.2	cu ft/mo
December	186000	gpd	756249.2	cu ft/mo
	188250	gpd	765397.3	cu ft/mo

			0.054
July	2000	0.061	0.007
August	2000	0.06	0.006
September	2000	0.065	0.011
October	2000	0.04	-0.014
November	2000	0.057	0.003
November	2001	0.037	-0.017
December	2001	0.049	-0.005
January	2002	0.071	0.017
February	2002	0.107	0.053
March	2002	0.09	0.036
April	2002	0.097	0.043
May	2002	0.062	0.008
		0.066	0.012

#NAME?

Run-off volume: (based on hydrologic soil group c)
Hydrologic Soil Group: C

From Western Regional Climate Center
average Bayview

0.144709

	SCS CN	S	description	Precipitation	50-year dry	50-yr wet	Qavg		Q 50-yr dry	Q 50-yr we	random precip	random #	random runoff, Q
Jan.	98	0.204082	frozen ground	2.86	1.2	4.75	2.628878309	in.	0.985653183	4.513579	3.431365	0.754397	3.198053929
Feb.	98	0.204082	frozen ground	2.27	0.39	5.92	2.042218675	in.	0.220381138	5.681949	2.402644	0.556109	2.173977591
Mar.	92	0.869565	saturated	2.06	0.47	5.23	1.290919094	in.	0.075208958	4.314127	2.060172	0.500086	1.291073719
Apr.	89	1.235955	gravel	1.75	0.63	4.12	0.824618266	in.	0.090527537	2.935867	1.0757	0.114274	0.332496473
May	89	1.235955	gravel	2.06	0.66	5.57	1.077904482	in.	0.103356973	4.319761	2.501666	0.735964	1.456169591
June	89	1.235955	gravel	1.82	0.86	4.23	0.880717666	in.	0.203127521	3.039564	1.417648	0.200949	0.569299596
July	89	1.235955	gravel	1.02	0.05	1.95	0.29731403	in.	0.037433231	0.986659	0	0.01293	0
Aug.	89	1.235955	gravel	1.08	0	3.29	0.335258539	in.	0	2.163869	1.629619	0.845617	0.729880779
Sep.	89	1.235955	gravel	1.21	0	3.14	0.421601013	in.	0	2.02684	2.227099	0.953633	1.218968523
Oct.	89	1.235955	gravel	2.07	0.47	4.6	1.086266401	in.	0.034031443	3.390185	0.445599	0.021153	0.027444697
Nov.	92	0.869565	saturated	2.92	1.81	7.94	2.085652383	in.	1.068296932	6.984082	2.649646	0.313085	1.83219956
Dec.	98	0.204082	frozen ground	3.22	1.86	7.75	2.98741243	in.	1.635687237	7.510365	3.115385	0.438866	2.883190237
total				24.33	20	43.72							
sum				24.34	8.4	58.49	15.95876129		4.453704154	47.86685	22.95654		15.7127547

Average of Sandpoint and Moscow, from Western Region Climate Center

Average Annual Evaporation:				Evaporative Index Parameters							
	Monthly Evaporation:			Pan Evap	AvgTemp	Pressure	Dew Pt.	wind	Corr Factor	Est. evap	
	Jan	0.00	inches	0.01	24.3	28.1896333	23	9.3	0.39088141	0.000459874	0.3
	Feb	0.00	inches	0.02	29	28.1896333	25	9.7	0.405366503	9.04661E-05	0.5
	Mar	1.02	inches	1.52	37.8	28.1896333	28	10.5	0.427801023	1.023231369	1.3
	Apr	1.29	inches	1.93	46.7	28.1896333	34	10.7	0.466558154	1.294470315	5.27
	May	3.72	inches	5.41	54.5	28.1896333	40	9.9	0.500823369	3.722068971	7.62
	Jun	4.07	inches	5.91	59.9	28.1896333	46	9.5	0.536133325	4.071708535	8.71
	Jul	5.49	inches	7.97	67.4	28.1896333	47	8.7	0.538722433	5.491778132	10.42
	Aug	5.15	inches	7.47	65.6	28.1896333	47	8.5	0.537809877	5.149812762	9.29
	Sep	3.30	inches	4.82	58.8	28.1896333	40	8.6	0.495157233	3.299897551	5.94
	Oct	1.01	inches	1.52	47.6	28.1896333	34	8.8	0.458544822	1.011686101	2.3
	Nov	0.98	inches	1.43	34.6	28.1896333	29	9.4	0.429580585	0.9776451	0.6
	Dec	0.00	inches	0.03	28.5	28.1896333	24	9	0.395966369	0.000201117	0.3
		26.04		38.04							
											52.54

Existing Pond Volumes
Cell 1 - Mechanical Plant

depth	area	volume	length	width

Regression Output:

Regression Output:

Regression Output:

Wyatt Engineering, Inc.
1220 N. Howard Street
Spokane, WA

Plummer Waste Water Treatment

27-Sep-02
Prepared by Alan E. Gay
Wyatt Engineering

												0.054	
	0	-792	0	24	-33	Constant		-792	Constant		0	Constant	
	2	-756	-1548	36	-21	Std Err of Y Est		93.92	Std Err of Y Est		0.040364	Std Err of Y Est	
	8	1080	-576	72	15	R Squared		1.00	R Squared		0.999404	R Squared	
	10	2268	2772	84	27	No. of Observations		5.00	No. of Observations		5	No. of Observations	
	12	3744	8784	96	39	Degrees of Freedom		3	Degrees of Freedom		3	Degrees of Freedom	
top		8775		117	75	X Coefficient(s)	366.1791045		X Coefficient(s)	0.000932371		X Coefficient(s)	0.419388869
						Std Err of Coef.	32.79894971		Std Err of Coef.	1.35455E-07		Std Err of Coef.	0.000396573
		761930.2232				to obtain area from depth:			to obtain depth from volume:			to obtain area from volume:	
						enter depth, multiply by	366.1791045		enter vol., multiply by	0.000932371		enter vol., multiply by	0.419388869
						add	-792.00		add	0.0000		add	-792.00
Cell 2 - Equalization Basin													
depth		area	volume	length	width	Regression Output:			Regression Output:			Regression Output:	
	0	102416	0	346	296	Constant		102416	Constant		0	Constant	
	1	106304	104360	352	302	Std Err of Y Est		94.94187	Std Err of Y Est		0.034974	Std Err of Y Est	
	2	110264	212644	358	308	R Squared		0.999817	R Squared		0.999552	R Squared	
	4	118400	441308	370	320	No. of Observations		5	No. of Observations		5	No. of Observations	
	6	126824	686532	382	332	Degrees of Freedom		3	Degrees of Freedom		3	Degrees of Freedom	
	8	135536	948892	394	344								
	9	140000	1086660	400	350								
top		100746		261	386	X Coefficient(s)	4177.680934		X Coefficient(s)	8.26605E-06		X Coefficient(s)	0.034560065
						Std Err of Coef.	33.15513776		Std Err of Coef.	1.25791E-07		Std Err of Coef.	0.00020634
		521320.6791				to obtain area from depth:			to obtain depth from volume:			to obtain area from volume:	
						enter depth, multiply by	4177.680934		enter vol., multiply by	8.26605E-06		enter vol., multiply by	0.034560065
						add	102416.00		add	0.0000		add	102416.00
Cell 3 -													
depth		area	volume	length	width	Regression Output:			Regression Output:			Regression Output:	
	0	0	0	0	0	Constant		#NUM!	Constant		#NUM!	Constant	
	0	0	0	0	0	Std Err of Y Est		14.40846	Std Err of Y Est		0.00402	Std Err of Y Est	
	0	0	0	0	0	R Squared		0.999999	R Squared		0.999994	R Squared	
	0	0	0	0	0	No. of Observations		5	No. of Observations		5	No. of Observations	
	0	0	0	0	0	Degrees of Freedom		3	Degrees of Freedom		3	Degrees of Freedom	
	0	0	0	0	0								
top:		0				X Coefficient(s)	#NUM!		X Coefficient(s)	#NUM!		X Coefficient(s)	#NUM!
		0				Std Err of Coef.	5.03165175		Std Err of Coef.	9.44024E-10		Std Err of Coef.	3.66713E-06
		9412.734483				to obtain area from depth:			to obtain depth from volume:			to obtain area from volume:	
						enter depth, multiply by	#NUM!		enter vol., multiply by	#NUM!		enter vol., multiply by	#NUM!
						add	#NUM!		add	#NUM!		add	#NUM!
Cell 4 & 5													
depth		area	volume	length	width	area Regression Output:			Regression Output:			area fr. vol Regression Output:	
	0	0	0	0	0	Constant		0	Constant		0	Constant	
	0	0	0	0	0	Std Err of Y Est		19.44222	Std Err of Y Est		0.065676	Std Err of Y Est	
	0	0	0	0	0	R Squared		0.999837	R Squared		0.998706	R Squared	
	0	0	0	0	0	No. of Observations		5	No. of Observations		5	No. of Observations	
	0	0	0	0	0	Degrees of Freedom		3	Degrees of Freedom		3	Degrees of Freedom	
						X Coefficient(s)	#NUM!		X Coefficient(s)	#NUM!		X Coefficient(s)	#NUM!
						Std Err of Coef.	6.14817046		Std Err of Coef.	1.51412E-06		Std Err of Coef.	0.000814853
						to obtain area from depth:			to obtain depth from volume:			to obtain area from volume:	
						enter depth, multiply by	#NUM!		enter vol., multiply by	#NUM!		enter vol., multiply by	#NUM!

Wyatt Engineering, Inc.
1220 N. Howard Street
Spokane, WA

Plummer Waste Water Treatment

27-Sep-02
Prepared by Alan E. Gay
Wyatt Engineering

add 0.00 add 0.0000 add 0.054 0.00

Benewah County Area, Hydrologic type C
Cald, Silt Loam
Infiltration Rate Calculation
SCS Permeability ('K') 1980
0.6 inches/hour peak
0.2 inches/hour min.
0.000423333 cm/sec, peak
0.000141111 cm/sec, min.
Check With Freeze & Cherry for this soil type:
0.00001 cm/sec, peak
0.000000001 cm/sec, min.
Utilize:
0.00001 cm/sec.
Assume sealing with human waste, 1 order of magnitude reduction:
0.000001 cm/sec.

Benewah County Area, Hydrologic type C
Lacy, Stony Loam
Infiltration Rate Calculation
SCS Permeability ('K') 1980
2 inches/hour peak
0.6 inches/hour min.
0.001411111 cm/sec, peak
0.000423333 cm/sec, min.
Check With Freeze & Cherry for this soil type:
0.001 cm/sec, peak
0.0000001 cm/sec, min.
Utilize:
0.000917222 cm/sec.
Assume sealing with human waste, 1 order of magnitude reduction:
9.17222E-05 cm/sec.

Plummer Water Usage as Basis for ERU count
08/30/02
Compiled by AEG from 2000 City of Plummer Data
Gallons/residential Service: 5300 per month

User	water use gallons/mo	equiv. ERU		
	12500	2.358490566	1	
	25750	4.858490566	1	
	4826	1	1	
	167	1	1	
	19670	3.711320755	1	
		1	1	
	28267	5.333396226	1	
	2555	1	1	
	70	1	1	
	667	1	1	
	1000	1	1	
	1956	1	1	
	43773	8.259056604	1	
	2910	1	1	
	2248	1	1	
	21400	4.037735849	1	
	4333	1	1	
	51000	9.622641509	1	
	4000	1	1	
	34000	6.41509434	1	
	1665	1	1	
	108000	20.37735849	1	
	2950	1	1	
	3833	1	1	
	1000	1	1	
	30000	5.660377358	1	
		1	1	
		1	1	
	500	1	1	
	500	1	1	
	4000	1	1	
	1000	1	1	
	1000	1	1	
	50	1	1	
	50	1	1	
	500	1	1	
	12000	2.264150943	1	
	4800	1	1	
	1000	1	1	
	1500	1	1	
		1	1	
		1	1	
	10670	2.013207547	1	
	23000	4.339622642	1	
	18000	3.396226415	1	
	3000	1	1	
	740	1	1	
	28000	5.283018868	1	
	1000	1	1	
		1	1	
	3000	1	1	
	3500	1	1	
	1150	1	1	
commercial ERUs		**126**	53	100
Residences:		345		
total:		471		**445** current total ERUs

Plummer ERU count/wastewater flow projection
08/30/02
Compiled by AEG from 1980 through 2000 Census Data

Year	Population	household:	ERUs			Benewah County		Ratios		Ratio Rate of Change	
1980	610	191		248	actual	8292	3499	0.092631	0.054631	0.007659	0.019612
1990	796	277		359	actual	7937	3731	0.10029	0.074243	0.007659	0.019612
2000	990	336	(345)	436	actual	9171	3580	0.107949	0.093855		
2002	1040	345		445	estimate						
2008	1206	400		516	projection						
2028	1977	656		846	projection						

Peak flows(MGD)	January	February	March	April	May	June	July	August	September	October	November	December	Peak Annual (MGD)	
2000	0.3	0.3	0.26	**0.31**	0.21	0.219	0.086	0.111	0.077	0.134	0.095	0.141	0.310	actual
2002	0.406	0.397	0.316	0.196	**0.42**	0.122	0.109	0.113	0.079	0.137	0.097	0.144	0.420	actual
2008	0.415	0.406	0.325	0.205	**0.429**	0.131	0.118	0.122	0.087	0.145	0.105	0.152	0.429	projection
2028	0.463	0.454	0.373	0.253	**0.477**	0.179	0.166	0.170	0.135	0.193	0.154	0.201	0.477	projection

	Tribe
Peak AVG	Peak AVG
0.268	0.318

Average flows(MGD)	January	February	March	April	May	June	July	August	September	October	November	December	Peak Average Annual (MGD)	
2000	0.19	0.15	0.12	0.092	0.123	0.092	0.0595	0.0585	0.0537	0.067	0.064	0.078	0.19	actual
2002	0.1429	0.128	0.137	0.0765	0.0556	0.0577	0.0674	0.0759	0.055	0.068	0.065	0.080	0.14	actual
2008	0.151	0.137	0.146	0.085	0.064	0.066	0.076	0.084	0.063	0.077	0.074	0.088	0.15	projection
2028	0.200	0.185	0.194	0.133	0.112	0.114	0.124	0.133	0.111	0.125	0.122	0.136	0.20	projection

Plummer ID Monthly Precipitation Totals (Station ID 107188)

	average, 1951-	High	year	Low	year	1 day max	day/year	>= .01"	>=.1"	>=.5"	>=1.0"	total snowfall Mean	High	Year
January	2.94	4.75	96	1.2	97	0.99	28/1992	13	9	1	0	7.5	31.5	96
February	3.15	5.92	96	0.39	90	1.17	23/1999	12	9	2	0	1.4	8	99
March	2.45	5.23	50	0.47	90	1.95	16/1950	11	8	1	0	0.6	5	89
April	2.08	4.12	97	0.63	51	1.49	24/1996	10	7	1	0	0	0	89
May	2.78	5.57	98	0.66	92	1.2	20/1994	10	7	2	0	0.3	3.5	100
June	1.9	4.23	50	0.86	89	1.44	Apr-90	8	5	1	0	0	0	89
July	0.72	1.95	97	0.05	99	1.02	14/1993	3	2	0	0	0	0	89
August	0.89	3.29	89	0	88	1.43	24/1989	4	2	0	0	0	0	88
r	0.93	3.14	95	0	90	1.07	28/1995	4	3	0	0	0	0	88
October	2.9	4.6	50	0.47	88	1.55	27/1994	10	7	2	0	0	0	88
November	4.26	7.94	96	1.81	90	1.45	Jan-94	17	13	2	0	0	0	89
December	4.24	7.75	96	1.86	97	1.2	May-89	16	11	3	0	4.2	10	88
Annual	29.23	43.72	96	26.85	97	1.95	19500316	119	84	15	2	14.1	14.5	99
Winter	10.33	15.65	96	7.19	98	1.2	19891205	41	30	6	0	13.2	8.5	99
Spring	7.31	10.63	97	3.27	92	1.95	19500316	32	23	3	1	0.8	5	89
Summer	3.5	5.36	90	2.08	98	1.44	19900604	15	9	2	0	0	0	89
Fall	8.09	13.83	96	5.55	90	1.55	19941027	31	23	4	1	0	0	89

IDAHO Pan Evaporation Data

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	annual	
MOSCOW UNIV OF IDAHO | 1893-2000 |	0.00	0.00	3.03	3.85	5.65	6.54	8.64	8.23	5.29	3.03	2.85	0.00	47.11	47.11
SANDPOINT EXPERMNT STN | 1910-2000 |	0.00	0.00	0.00	0.00	5.17	5.28	7.29	6.70	4.35	0.00	0.00	0.00	28.79	28.79
Blended average:	0.00	0.00	1.52	1.93	5.41	5.91	7.97	7.47	4.82	1.52	1.43	0.00		37.95

Plummer Creek (01-CJ020010)		STL ID	2571	2657	2741	2804	2915	3068	3277	3399
		CLIENT ID	0300	0300	0300	0300	0300	0300	0300	0300
		SAMPLE DATE	03/15/99	4/1/1999	4/15/1999	5/10/1999	6/2/1999	7/6/1999	10/1/1999	10/5/1999
ANALYSIS PARAMETERS	METHOD	UNITS								
PHYSICAL PROPERTIES										
Total Dissolved Solids	EPA 160.1	mg/L								
Total Suspended Solids	EPA 160.2	mg/L	7.37	4.50	3.50	3.62	<2.0	<2.0	11.9	<2.0
Turbidity	EPA 180.1	NTU	22.4	13.1	11.5	9.04	3.88	1.58	1.76	0.761
Hardness as CaCO3	EPA 200.7	mg/L								
INORGANIC, NON-METALLICS										
Chloride, Cl	EPA 300.0	mg/L	2.31	2.79	2.04	1.81	2.11	5.44	0.368	4.36
Fluoride, F	EPA 300.0	mg/L	0.060	0.030	<0.020	0.026	0.062	0.057	<0.020	0.054
Nitrate as N	EPA 300.0	mg/L	0.600	0.250	0.050	0.048	0.080	0.048	<0.005	0.027
Nitrite as N	EPA 300.0	mg/L	<0.010	<0.010	<0.010	<0.005	<0.005	<0.010	<0.010	<0.010
Total Phosphorous	EPA 200.7	mg/L	0.039	0.017	0.016	0.035	0.027	0.033	0.013	0.025
ortho-Phosphate as P	EPA 300.0	mg/L	<0.020	<0.020	<0.020	<0.010	0.024	0.024	<0.010	<0.010
Sulfate	EPA 300.0	mg/L	3.60	3.58	3.38	3.07	3.73	4.90	1.51	4.87
TKN	EPA 351.4	mg/L	0.406	0.246	0.684	0.206	<0.100	0.128	0.110	<0.100

		SAMPLE DATE	04/03/00	04/25/00	05/05/00	05/18/00	6/27/2000	9/27/2000
ANALYSIS PARAME	METHOD	UNITS						
PHYSICAL PROPERTIES								
Total Dissolved Solids	EPA 160.1	mg/L						
Total Suspended Solids	EPA 160.2	mg/L	6.00	8.00	3.00	<2.0	3.00	5.00
Turbidity	EPA 180.1	NTU	14.9	13.3	8.95	13.2	2.11	0.506
Hardness as CaCO3	EPA 200.7	mg/L						
INORGANIC, NON-METALLICS								
Chloride, Cl	EPA 300.0	mg/L	1.16	1.77	2.59	1.58	2.60	4.48
Fluoride, F	EPA 300.0	mg/L	<0.020	<0.020	0.027	0.038	0.042	<0.020
Nitrate as N	EPA 300.0	mg/L	0.054	0.161	0.058	0.027	0.054	0.112

Nitrite as N	EPA 300.0	mg/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Total Phosphorous	EPA 200.7	mg/L	0.030	0.065	0.018	0.058	0.068	0.032
ortho-Phosphate as P	EPA 300.0	mg/L	<0.006	0.030	0.022	<0.006	0.067	0.032
Sulfate	EPA 300.0	mg/L	2.45	3.20	2.58	2.84	3.31	6.62
TKN	EPA 351.4	mg/L	0.127	0.171	0.351	0.112	0.097	0.110

			SAMPLE DATE	3/22/2001	4/11/2001	5/10/2001	5/23/2001
ANALYSIS	P Detection lim	METHOD	UNITS				
PHYSICAL PROPERTIES							
Total Dissolve	7	EPA 160.1	mg/L				
Total Suspen	2	EPA 160.2	mg/L	4.80	12.2	2.00	2.90
Turbidity	0.02	EPA 180.1	NTU	18.4	14.4	10.5	5.11
Hardness as	0.33	EPA 200.7	mg/L				
INORGANIC NON-METALLICS							
Chloride, Cl	0.02	EPA 300.0	mg/L	4.10	4.71	3.95	5.56
Fluoride, F	0.02	EPA 300.0	mg/L	0.175	0.284	0.239	0.033
Nitrate as N	0.005	EPA 300.0	mg/L	1.78	1.34	0.350	0.130
Nitrite as N	0.01	EPA 300.0	mg/L	<0.010	<0.010	<0.010	<0.010
Total Phosph	0.005	EPA 200.7	mg/L		0.073	0.072	0.055
ortho-Phosph	0.01	EPA 300.0	mg/L	0.064	0.032	0.048	0.036
Sulfate	0.03	EPA 300.0	mg/L	4.36	4.16	4.05	4.13
TKN	0.02	EPA 351.2	mg/L		0.560	0.323	0.659

Supplemental to Plummer Creek Data
Phosphorus Discharges from Plummer Wastewater Treatment Facility
September 27, 2002
Prepared by Alan E. Gay, P.E.
Wyatt Engineering, Inc.

The following phosphorus loads are estimates. The 1999 through 2001 estimates are based on a per capita loading of 0.007 pounds per day, a population of 990 people in Plummer, and the recorded flows for the November through May period I also estimated that the effective phosphorus removal through the plant averages 50%, based on settlement and filtration.

	Jan-99	Feb-99	Mar-99	Apr-99	May-99	Nov-99	Dec-99
Estimated TP load (lbs/day)	6.93	6.93	6.93	6.93	6.93	6.93	6.93
Estimated TP effluent (lbs/day)	3.465	3.465	3.465	3.465	3.465	3.465	3.465
Recorded avg. Plant Flow (mgd)	0.1477	0.19975	0.14229	0.154067	0.124839	0.115033	0.219133
Estimated Plant Discharge Conc. (mg/L)	2.812534	2.079656	2.919463	2.696309	3.327584	3.611225	1.895701
Recorded Creek Flow @ Mouth (cfs)	89.916	NA	54	26.45983	14.7335	NA	NA
dilution ratio, Creek:Plant	393.4865	#VALUE!	245.274	111.0074	76.2834	#VALUE!	#VALUE!
Recorded TP, Mouth, mg/L:	NA	NA	**0.039**	**0.017**	**0.035**	NA	NA
Calculated Creek Load, lbs/day:	#VALUE!	#VALUE!	11.353	2.354	2.780	#VALUE!	#VALUE!
Estimated non-plant TP, lbs/day:	#VALUE!	#VALUE!	7.888	-1.111	-0.685	#VALUE!	#VALUE!
Estimated non-plant TP, mg/L:	#VALUE!	#VALUE!	0.027	-0.008	-0.009	#VALUE!	#VALUE!

	Jan-00	Feb-00	Mar-00	Apr-00	May-00	Nov-00	Dec-00
Estimated TP load (lbs/day)	6.93	6.93	6.93	6.93	6.93	6.93	6.93
Estimated TP effluent (lbs/day)	3.465	3.465	3.465	3.465	3.465	3.465	3.465
Recorded avg. Plant Flow (mgd)	0.199258	0.152207	0.123516	0.091867	0.123419	0.064967	0.078194
Estimated Plant Discharge Conc. (mg/L)	2.08479	2.729254	3.363215	4.521894	3.365852	6.394222	5.312603
Recorded Creek Flow @ Mouth (cfs)	NA	NA	NA	14.38	14.7335	NA	NA
dilution ratio, Creek:Plant	#VALUE!	#VALUE!	#VALUE!	101.1753	77.16068	#VALUE!	#VALUE!
Recorded TP, Mouth, mg/L:	NA	NA	NA	**0.048**	**0.038**	NA	NA
Calculated Creek Load, lbs/day:	#VALUE!	#VALUE!	#VALUE!	3.683	3.018	#VALUE!	#VALUE!
Estimated non-plant TP, lbs/day:	#VALUE!	#VALUE!	#VALUE!	0.218	-0.447	#VALUE!	#VALUE!
Estimated non-plant TP, mg/L:	#VALUE!	#VALUE!	#VALUE!	0.003	-0.006	#VALUE!	#VALUE!

Note: May flow in creek is estimated

	Jan-01	Feb-01	Mar-01	Apr-01	May-01	Nov-01	Dec-01
Estimated TP load (lbs/day)	6.93	6.93	6.93	6.93	6.93	6.93	6.93
Estimated TP effluent (lbs/day)	3.465	3.465	3.465	3.465	3.465	3.465	3.465
Recorded avg. Plant Flow (mgd)	0.1266	0.113393	0.179603	0.16	0.119226	0.071846	0.201935
Estimated Plant Discharge Conc. (mg/L)	3.28129	3.66347	2.312939	2.596321	3.48424	5.781956	2.057149
Recorded Creek Flow @ Mouth (cfs)	NA	NA	26.89	66.4825	6.52	NA	NA
dilution ratio, Creek:Plant	#VALUE!	#VALUE!	96.77208	268.572	35.34685	#VALUE!	#VALUE!
Recorded TP, Mouth, mg/L:	NA	NA	**0.064**	**0.073**	**0.064**	NA	NA
Calculated Creek Load, lbs/day:	#VALUE!	#VALUE!	9.278	26.165	2.232	#VALUE!	#VALUE!
Estimated non-plant TP, lbs/day:	#VALUE!	#VALUE!	5.813	22.700	-1.233	#VALUE!	#VALUE!
Estimated non-plant TP, mg/L:	#VALUE!	#VALUE!	0.040	0.063	-0.035	#VALUE!	#VALUE!

Projected Loadings, Design (2028)

	1/1	2/1	3/1	4/1	5/1	11/1	12/1
Estimated TP load (lbs/day)	13.839	13.839	13.839	13.839	13.839	13.839	13.839
Estimated TP effluent (lbs/day)	0.345975	0.345975	0.345975	0.27678	0.207585	0.207585	0.27678
Projected avg. Plant Flow (mgd)	0.200	0.185	0.194	0.133	0.112	0.122	0.136
Estimated Plant Discharge Conc. (mg/L)	0.207907	0.224688	0.214243	0.249299	0.221802	0.204118	0.243607
Estimated Creek Flow @ Mouth (cfs)	15	52	30.00	25	4	2	100
dilution ratio, Creek:Plant	48.59758	182.0696	100.1572	121.4017	23.04241	10.60261	474.5191
Estimated TP, Mouth, mg/L:	**0.004**	**0.001**	**0.036**	**0.024**	**0.010**	**0.019**	**0.001**
Calculated Creek Load, lbs/day:	0.346	0.346	5.764	3.242	0.208	0.208	0.277
Estimated non-plant TP, lbs/day:	0.000	0.000	5.418	2.965	0.000	0.000	0.000
Estimated non-plant TP, mg/L:	0.000	0.000	0.034	0.022	0.000	0.000	0.000

Phosphorus removal based on using biological nutrient removal to achieve 1 mg/L (90% removal) followed by alum addition to achieve 0.5 mg/L (50% reduction) and filtration to remove most of the remaining TP to 0.25 mg/L or less (50%+ reduction) for a total reduction of 97.5% or better. We will achieve this with either a new mechanical treatment plant or a retrofit of the existing facility.

Plummer Wastewater Treatment Facility
September 27, 2002
Process Calculations
Wyatt Engineering, Inc.
Prepared by Alan E. Gay, P.E.

Process Description
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Discharge to Plummer Creek, if this is selected, will be flow paced.

Settlement
Use Stokes Law to size the required area of the settlement cell of the new lined pretreatment portion of the plant:
vs = d^2 * g * (rp - rv)/(18*mu)
where:
vs = settlement velocity
d = particle diameter
g = acceleration due to gravity
rp = density of particle
rv = density of fluid
mu = dynamic viscosity of fluid

Assuming a worst case temperature of 5 deg. C, the dynamic viscosity of the water (assumed equivalent to Plummer's wastewater) is 1.519 centipoise, or 0.001021 lbs/ft-sec
Assume the particle diameter for removal is 0.05 mm = 0.000164 feet
Assume the particle specific gravity is 1.2 so the density is 74.88 lb/ft3
Therefore: vs = 0.000588 ft/sec.
And minimal area is Q/A = 380.3257 gpd/ft2
Qpeak= 477000 gpd, non-tribal
A = 1254.188 ft2
Use a FS of 2: 2508.376 ft2, say 2500 ft2
Use a maximum depth of 8 ft., 3:1 side slopes.
Width: 247 feet
length: 10.12146 feet
actual depth: 3.373819 feet
Incorporate the settlement cell into the Anoxic Cell

Anoxic Biological Treatment
Phosphorus Removal
Use Monod Model s=D*Ks/(mu-D)
where
s= concentration of nutrient
D= dilution rate = F/V = Feed rate/volume = days^(-1)
Ks = half saturation coefficient = 1 mg/L
mu = maximum growth rate coefficient = 1.5 mg/L/Day
Influent P: 10 mg/L
Effluent P: 0.25 mg/L
Required retention time: 0.735043 days
Qpeak= 477000 gpd, non-tribal
Vmin.= 46867.45 ft3
Use first 70 feet of first cell
Volume: 50336 ft3
Nitrogen Removal
Use Monod Model s=D*Ks/(mu-D)
where
s= concentration of nutrient
D= dilution rate = F/V = Feed rate/volume = days^(-1)
Ks = half saturation coefficient = 5 mg/L
mu = maximum growth rate coefficient = 1.5 1/Day
Influent TKN (N): 50 mg/L
Effluent NO2 (N) 1 mg/L
Required retention time: 0.734694 days
Qpeak= 477000 gpd, non-tribal
Vmin.= 46845.21 ft3

Aerobic Treatment
BOD removal: Le/Lo = 1/(1+kt), t=(Lo/Le-1)/kT
kT = k20*theta^(T-20)
where:
Le = effluent BOD, mg/L
Lo = influent BOD, mg/L

k = BOD removal constant, per day
t = detention time, days
theta = temperature coefficient

Le:	20		Le:	20		
Lo:	237		Lo:	237		
k20:	0.5 (conservative estimate)		k20:	0.5 (conservative estimate)		
theta:	1.035		theta:	1.035		
T:	4 deg. C		T:	30 deg. C		
kT:	0.29		kT:	0.71		
therefore, t =	37.63 days		therefore, t	15.38 days		
Lagoon Vol.:	7525499 gallons at	4 deg. C	Lagoon Vol.:	gallons at	30 deg. C	
	1005948 cubic feet					
	12 working depth					
	175 bottom width					
	83829.03 sq. ft.average area					
	211 average width					
	247 top width (3:1 side slopes)					
	427.1518 top length					

Oxygen Required/day = lb of BOD removed per day (coefficient = 1.0):

concentration BOD removed:	217 mg/L	91.56% reduction	For	30 deg. C	
Influent Flow:	200000.00 gal/day		BOD removal =	381.0127 lbs/day	
Influent BOD Load:	395.4 lbs/day		=	15.87553 lbs/hour	
lbs removed/day:	362.0051 lbs/day				
Oxygen required/day =	362.0051 lbs/day; say	400 lbs/day			
Oxygen required/hour =	16.66667 lbs/hr				

Oxygen transfer, convential surface aerators:
R = Ro*(B*Cs - Ct)/9.2*1.02^(T-20)*alpha
where:

R = actual rate of oxygen transfer, lb of O2/hp-hr
Ro = rate of O2 transfer of manufacturer's unit under standard conditions, lb of O2/hp-hr
B = oxygen saturation coefficient of wastewater
Cs = oxygen concentration at saturation, mg/L
Ct = oxygen concentration existing in liquid, mg/L
T = temperature of lagoon liquid, deg. C
alpha = oxygen transfer coefficient
9.2 = saturation of oxygen concentration in pure water at 20 deg. C, mg/L

Try Ro of	2.5 lbs O2/hp-hr		Try Ro of	2.5 lbs O2/hp-hr	
B	0.8		B	0.8	
alpha	0.9		alpha	0.9	
Cs	13.1 at	4 deg. C	Cs	7.6 at	30 deg. C
Ct	2		Ct	2	
Therefore R:	1.51		Therefore I	1.22	
power required:	11.03 hp		power requ	13.05184 hp	
Use 2	7.5 hp surface aerators				

Anaerobic Cell

Utilize second cell for anaerobic treatment, keep will mixed with propellor mixer(s)

minimum volume =	0.3 * aerated basin volume (10-state standards)
Volume:	301784.5 cubic feet
	2257650 gallons
	12 working depth
	175 bottom width
	25148.71 sq. ft.average area
	211 average width
	247 top width (3:1 side slopes)
	149.046 top length

Plummer Wastewater Treatment Facility
September 27, 2002
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d = particle diameter
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rv = density of fluid
mu = dynamic viscosity of fluid

Assuming a worst case temperature of 5 deg. C, the dynamic viscosity of the water (assumed equivalent to Plummer's wastewater) is 1.519 centipoise, or 0.001021 lbs/ft-sec
Assume the particle diameter for removal is 0.05 mm = 0.000164 feet
Assume the particle specific gravity is 1.2 so the density is 74.88 lb/ft3

Therefore:	vs =	0.000588	ft/sec.	
And minimal area is	Q/A =	380.3257	gpd/ft2	
Qpeak=	477000	gpd, non-tribal		
A =	1254.188	ft2		
Use a FS of 2:	2508.376	ft2, say	2500	ft2

Use a maximum depth of 8 ft., 3:1 side slopes.

Width:	247	feet
length:	10.12146	feet
actual depth:	3.373819	feet

Incorporate the settlement cell into the Anoxic Cell

Anoxic Biological Treatment
Phosphorus Removal
Use Monod Model s=D*Ks/(mu-D)
where

s= concentration of nutrient
D= dilution rate = F/V = Feed rate/volume = days^(-1)
Ks = half saturation coefficient = 1 mg/L
mu = maximum growth rate coefficient = 1.5 mg/L/Day

Influent P:	10	mg/L
Effluent P:	1	mg/L
Required retention time:	0.740741	days
Qpeak=	527000	gpd, tribal
Vmin.=	52181.58	ft3

Use first 70 feet of first cell
Volume: 50336 ft3
Nitrogen Removal
Use Monod Model s=D*Ks/(mu-D)
where

s= concentration of nutrient
D= dilution rate = F/V = Feed rate/volume = days^(-1)
Ks = half saturation coefficient = 5 mg/L
mu = maximum growth rate coefficient = 1.5 1/Day

Influent TKN (N):	50	mg/L
Effluent NO2 (N)	1	mg/L
Required retention time:	0.734694	days
Qpeak=	527000	gpd, tribal
Vmin.=	51755.6	ft3

Aerobic Treatment
BOD removal: Le/Lo = 1/(1+kt), t=(Lo/Le-1)/kT
kT = k20*theta^(T-20)
where:

Le = effluent BOD, mg/L
Lo = influent BOD, mg/L

k = BOD removal constant, per day
t = detention time, days
theta = temperature coefficient

Le:	60		Le:	20		
Lo:	237		Lo:	237		
k20:	0.5 (conservative estimate)		k20:	0.5 (conservative estimate)		
theta:	1.035		theta:	1.035		
T:	4 deg. C		T:	30 deg. C		
kT:	0.29		kT:	0.71		
therefore, t =	10.23 days		therefore, t	15.38 days		
Lagoon Vol.:	2557629 gallons at	4 deg. C	Lagoon Vol.:		gallons at	30 deg. C
	341883.4 cubic feet					
	8 working depth					
	199 bottom width					
	42735.42 sq. ft.average area					
	223 average width					
	247 top width (3:1 side slopes)					
	213.0557 top length					

Oxygen Required/day = lb of BOD removed per day (coefficient = 1.0):			For	30 deg. C	
concentration BOD removed:	177 mg/L	74.68% reduction	BOD removal =	434.0565 lbs/day	
Influent Flow:	250000.00 gal/day				
Influent BOD Load:	494.2 lbs/day		=	18.08569 lbs/hour	
lbs removed/day:	369.095 lbs/day				
Oxygen required/day =	369.095 lbs/day; say	400 lbs/day			
Oxygen required/hour =	16.66667 lbs/hr				

Oxygen transfer, convential surface aerators:
R = Ro*(B*Cs - Ct)/9.2*1.02^(T-20)*alpha
where:

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Ro = rate of O2 transfer of manufacturer's unit under standard conditions, lb of O2/hp-hr
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T = temperature of lagoon liquid, deg. C
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9.2 = saturation of oxygen concentration in pure water at 20 deg. C, mg/L

Try Ro of	2.5 lbs O2/hp-hr		Try Ro of	2.5 lbs O2/hp-hr	
B	0.8		B	0.8	
alpha	0.9		alpha	0.9	
Cs	13.1 at	4 deg. C	Cs	7.6 at	30 deg. C
Ct	2		Ct	2	
Therefore R:	1.51		Therefore I	1.22	
power required:	11.03 hp		power requ	14.86889 hp	
Use 2	7.5 hp surface aerators				

Anaerobic Cell
Utilize second cell for anaerobic treatment, keep will mixed with propellor mixer(s)

minimum volume =	0.3 * aerated basin volume (10-state standards)
Volume:	**102565 cubic feet**
	767288.8 gallons
	11.5 working depth
	178 bottom width
	8918.696 sq. ft.average area
	212.5 average width
	247 top width (3:1 side slopes)
	70.86916 top length

Plummer Wastewater Treatment Facility
September 27, 2002
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Wyatt Engineering, Inc.
Prepared by Alan E. Gay, P.E.

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Volume: 50336 ft3
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k20:	0.5	(conservative estimate)		k20:	0.5	(conservative estimate)
theta:	1.035			theta:	1.035	
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lbs removed/day:	369.095 lbs/day				
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alpha = oxygen transfer coefficient
9.2 = saturation of oxygen concentration in pure water at 20 deg. C, mg/L

Try Ro of	2.5 lbs O2/hp-hr		Try Ro of	2.5 lbs O2/hp-hr		
B	0.8		B	0.8		
alpha	0.9		alpha	0.9		
Cs	13.1 at	4 deg. C	Cs	7.6 at	30 deg. C	
Ct	2		Ct	2		
Therefore R:	1.51		Therefore I	1.22		
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	11.5	working depth
	178	bottom width
	8918.696	sq. ft.average area
	212.5	average width
	247	top width (3:1 side slopes)
	70.86916	top length

COD	50	lbs/acre/day								
N	150	lbs/acre/day				Allowable conc.				
P	27	lbs/acre/day			flow	COD	BOD	N	P
			acres	lbs/day	cu.ft/day	(mg/L)	(mg/L)	(mg/L)	(mg/L)
COD	50	lbs/acre/day	20	1000	57702.78	277.7273	185.1516	11.10909	5.554547
N	2	lbs/acre/day	20	40	69673.29	230.0113	153.3408	9.20045	4.600225
P	1	lbs/acre/day	20	20	69944.26	229.1202	152.7468	9.164807	4.582404
					60938.93	262.9787	175.3191	10.51915	5.259574
					57844.39	277.0474	184.6983	11.0819	5.540949
					56005.11	286.1461	190.764	11.44584	5.722921
					43782.75	366.0263	244.0176	14.64105	7.320527
					56451.26	283.8846	189.2564	11.35538	5.677691
					46679.73	343.3105	228.8737	13.73242	6.86621
					46609.26	343.8295	229.2197	13.75318	6.87659
					59895.76	267.5589	178.3726	10.70235	5.351177
					61276.63	261.5294	174.353	10.46118	5.230589

WYATT ENGINEERING, INC.
A Subsidiary of
USKH

Memorandum

DATE:	9/11/02	**W.O. #:**	685900
TO:	Alan Gay	**CC:**	John Manion
FROM:	Tracy Johnson		
SUBJECT:	Plummer Cost Estimates: Disposal Systems		

Alan,

I have provided rough cost estimates for the following wastewater disposal methods (in lieu of surface water discharge). These estimates are based on construction experience, supplier quotes, and manufacturer's recommendations. Naturally, the estimates presented herein are based on approximate disposal rates and "ballpark" calculations of system components, but should give you an idea of potential cost impacts for evaluation purposes.

1. Land Application: Subsurface Drip Irrigation
   a. Without Tribe .... $850,000 - $950,000
   b. With Tribe: .... $1,100,000 - 1,200,000
2. Land Application: Subsurface Disposal (Mound System)
   a. Without Tribe: .... $1,300,000 - $1,500,000
   b. With Tribe: .... $1,500,000 - $1,700,000
3. Total Containment
   a. Without Tribe .... $55,000,000 - $60,000,000
   b. With Tribe .... $65,000,000 - $70,000,000

Geoflow Subsurface Dripline Disposal Field Calculation

Job Description:	Plummer WWTP
Engineer:	Wyatt Engineering, Inc.
Prepared by:	Tracy Johnson
Date:	10-Sep-02
Project No.	685900

Worksheet - Field Design

		Single Zone	Multiple Zones	
Number of Zones		1	56	zone(s)
A)	Quantity of effluent to be disposed per day	[redacted]	4,464	gallons / day
B)	Hydraulic loading rate	0.2	0.2	gallons / sq.ft. / day
C)	Determine total area required	**1,250,000**	29 acres 22,321	square ft.
D)	Choose spacing between WASTEFLOW lines	1	1	ft.
D)	Choose spacing between WASTEFLOW emitters	1	1	ft.
E)	Total linear ft.	1,250,000	22,321	each
F)	Total number of emitters	1,250,000	22,321	each
G)	Write "Classic" for WASTEFLOW Classic or write "PC" for pressure compensating dripline	PC	PC	WASTEFLOW dripline
H)	Pressure at the beginning of the dripfield	25	25	psi
I)	Feet of Head at the beginning of the dripfield	57.75	57.75	ft.
J)	What is the flow rate per emitter in gph?	0.53	0.53	gallons per hour
K)	Total flow for the area (gph)	662,500	11,830	gallons per hour
	Total flow for the area (gpm)	11041.67	**197.17**	**gallons per minute**
L)	Select pipe diameters for manifolds and submains	Refer to a PVC chart	6	inch
M)	Select Vortex Filter (item no.)	Consult Factory	Consult Factory	
N)	Maximum length of each WASTEFLOW line. Sketch a layout of the WASTEFLOW lines in the disposal plot to make sure that the maximum lateral length of each WASTEFLOW dripline is not exceeded.	260	260	ft.

With Tribe - 250,000 GPD

Plummer Wastewater Improvements Project
Plummer, ID

TKJ 9/10/02

***Estimated Cost for Construction:* Mound Disposal System**
Average Daily Flow = 0.25MGD

Item	Description	Qty	Unit	Unit Price	Contingency	Price
1	Tanks	5	EA	$1,500	$1,500	$9,000
2	Electrical & Controls	1	LS	$55,000	$11,000	$66,000
3	Electrical Conduit	1	LS	$7,500	$1,500	$9,000
4	Site preparation	1	LS	$20,000	$4,000	$24,000
5	C33 Sand mound fill	18,000	CY	$25	$90,000	$540,000
6	Geotextile	170,000	SF	$2	$68,000	$408,000
7	Effluent Screens	5	EA	$200	$200	$1,200
8	Pump Chambers	2	EA	$800	$320	$1,920
9	PVC Transport Pipe	5,000	LF	$10	$10,000	$60,000
10	PVC Fittings	1	LS	$500	$100	$600
11	PVC Laterals	60,000	LF	$5	$60,000	$360,000
12	PVC Manifolds	750	LF	$4	$600	$3,600
13	Valves/cleanouts	30	EA	$250	$1,500	$9,000
14	Appurtenances	1	LS	$50,000	$10,000	$60,000
15	Trench Backfilling	6,000	CY	$8	$9,600	$57,600
16	Tank Backfilling	300	CY	$8	$480	$2,880
17	Topsoil	600	CY	$3	$360	$2,160
18	Grading/Finishing	1	AC	$1,000	$200	$1,200
19	Seeding	5	AC	$1,500	$1,500	$9,000
					Total	***$1,625,160***

Estimated Cost of Construction (including 20% contingency) = $1.5M - $1.7M

Plummer Wastewater Improvements Project
Plummer, ID

TKJ 9/10/02

Estimated Cost for Construction: Mound Disposal System
Average Daily Flow = 0.2MGD

Item	Description	Qty	Unit	Unit Price	Contingency	Price
1	Tanks	4	EA	$1,500	$1,200	$7,200
2	Electrical & Controls	1	LS	$55,000	$11,000	$66,000
3	Electrical Conduit	1	LS	$7,500	$1,500	$9,000
4	Site preparation	1	LS	$20,000	$4,000	$24,000
5	C33 Sand mound fill	15,000	CY	$25	$75,000	$450,000
6	Geotextile	160,000	SF	$2	$64,000	$384,000
7	Effluent Screens	4	EA	$200	$160	$960
8	Pump Chambers	2	EA	$800	$320	$1,920
9	PVC Transport Pipe	5,000	LF	$10	$10,000	$60,000
10	PVC Fittings	1	LS	$500	$100	$600
11	PVC Laterals	45,000	LF	$5	$45,000	$270,000
12	PVC Manifolds	500	LF	$4	$400	$2,400
13	Valves/cleanouts	20	EA	$250	$1,000	$6,000
14	Appurtenances	1	LS	$50,000	$10,000	$60,000
15	Trench Backfilling	5,000	CY	$8	$8,000	$48,000
16	Tank Backfilling	200	CY	$8	$320	$1,920
17	Topsoil	500	CY	$3	$300	$1,800
18	Grading/Finishing	1	AC	$1,000	$200	$1,200
19	Seeding	5	AC	$1,500	$1,500	$9,000
					Total	***$1,404,000***

Estimated Cost of Construction (including 20% contingency) = $1.3M - $1.5M

Plummer Wastewater Improvements Project
Plummer, ID

TKJ 9/11/02

Estimated Cost for Construction: Total Containment
Peak Daily Flow: 0.527MGD

Containment Area Dimensions:		
Length:	6000	feet
Width:	3500	feet
Depth:	4	feet

Item	Description	Qty	Unit	Unit Price	Contingency	Price
1	Excavation Inc. Haul	3,111,111	CY	$14	$4,355,556	$47,911,111
2	Containment Area Grading/Comp	777,778	SY	$4	$311,111	$3,422,222
3	Liner	21,040,008	LS	$1	$4,208,002	$25,248,010
					Total	***$76,581,343***

Estimated Cost of Construction (including 10% contingency) = $75M - $80M

Price does not include land purchase (approximately 490 ac)

Plummer Wastewater Improvements Project
Plummer, ID

TKJ 9/11/02

Estimated Cost for Construction: Total Containment
Peak Daily Flow: 0.477MGD

Containment Area Dimensions:			
	Length:	6000	feet
	Width:	3000	feet
	Depth:	4	feet

Item	Description	Qty	Unit	Unit Price	Contingency	Price
1	Excavation Inc. Haul	2,666,667	CY	$14	$3,733,333	$41,066,667
2	Containment Area Grading/Comp	666,667	SY	$4	$266,667	$2,933,333
3	Liner	18,036,008	LS	$1	$3,607,202	$21,643,210
					Total	***$65,643,210***

Estimated Cost of Construction (including 10% contingency) = $65M - $70M

Price does not include land purchase (approximately 420 ac)

APPENDIX VI

Wastewater Treatment Plant
Cost Estimate Data

Option 1 W/Tribe
City of Plummer, Idaho
WWTP Option 1 W/Tribe
Biological Treatment with Extended Aeration and Activated Sludge in Modified Lagoons-Irrigation
Opinion of Probable Cost

No.	Description	Qty	Units	Unit Cost	Opinion of Probable Cost	
1	Mobilization	1	LS	$218,300.00	$218,300.00	
2	Influent Lift Station, Including Generator & Controls.	1	LS	$120,000.00	$120,000.00	
3	**Equalization Basin-Excavation, Compaction & Backfill**	**120000**	**CY**	**$10.00**	**$1,200,000.00**	$1.6M
5	**Equalization Basin-Liner**	**396000**	**SF**	**$1.00**	**$396,000.00**	
6	**Equalization Basin - Piping incl. valving**	**160**	**LF**	**$28.00**	**$4,480.00**	
5	Retrofit Existing Cells (Piping, etc) *Anoxic C1, 2-New. Aer. C1,*	650	LF	$28.00	$18,200.00	
6	Excavation of Existing Cells (Dredging) *Anoxic C1, 2-New. Aer. C1,*	25542	CY	$15.00	$383,130.00	
7	Sludge Dredging and Disposal *Anoxic C1, 2-New. Aer. C1,*	12771	CY	$15.00	$191,565.00	
8	Impermeable Membrane Liner, existing & new cells *Anoxic C1&2, New. Aer. C1&2, Anarobic C1&2*	214550	SF	$1.00	$214,550.00	
9	Allum injection into Additional Cell 1					
	Allum Injection Building	180	SF	$120.00	$21,600.00	
	Flash mix tank & mixer	1	LS	$5,000.00	$5,000.00	
	Pumps& Piping	1	LS	$8,000.00	$8,000.00	
	Electrical and Instrumentation	1	LS	$7,000.00	$7,000.00	
	Piping Force Main	300	LF	$30.00	$9,000.00	
10	Aeration Diffusers, Blower Equipment with Sound Attenuation, and Installation	1	LS	$218,000.00	$218,000.00	
11	Baffle Curtains	1	LS	$95,000.00	$95,000.00	
12	Retrofit Filter Cells (Piping, flow channels, etc) *Filter Cell 1, Add. Cell 1, Filter Cell 2, Add Cell 2*	400	FT	$28.00	$11,200.00	
13	Excavation of Existing Filter Cells (Dredge Sand) *Filter Cell 1 & Filter Cell 2, 3 & 4 (import new sand)*	4000	CY	$21.00	$84,000.00	
14	Impermeable Membrane Liner, Install new *Filter Cell 1 & Filter Cell 2, 3 & 4*	23000	SF	$1.25	$28,750.00	
15	Ultra-Violet Light Disinfection and pH Adjustment	1	LS	$105,000.00	$105,000.00	
16	Flow Paced Pump @ Plummer Creek Package VFD Paco or Equal	1	LS	$ 40,000.00	$ 40,000.00	
17	Wet Well for Flow Pace Pump	1	LS	$ 10,000.00	$ 10,000.00	
18	Extend 3PH Power to Flow Pace Pump	1	LS	$ 5,000.00	$ 5,000.00	
19	Convert Chlorination Lagoon to Equalization Lagoon	2000	CY	$ 21.00	$ 42,000.00	
20	Chlorination Lagoon Equalization Piping	100	LF	$ 28.00	$ 2,800.00	
21	Chlorination Lagoon Equalization MH- Suction	1	LS	$ 3,000.00	$ 3,000.00	
22	Impermeable Membrane Liner, Installed in new Equalization lagoon	11500	SF	$1.25	$14,375.00	
23	Irrigation Area (Existing Retrofit)	1	LS	$20,000.00	$20,000.00	
24	Irrigation Area (New Land Retrofit with Irrigation Equipment)	1	LS	$ 65,000.00	$ 65,000.00	
25	Solids Handling Drying Bed					
	Excavation, compaction & debris removal	2378	CY	$ 15.00	$ 35,670.00	
	Piping -Perf. (Gravity to Packaged Lift Station)	326	LF	$ 25.00	$ 8,150.00	
	Drain Rock	40	CY	$ 10.00	$ 400.00	
	Sand @ 6" of depth.	1189	CY	$ 17.50	$ 20,807.50	
	Geofabric	2048	SF	$ 1.00	$ 2,048.00	
	Liner	2048	SF	$ 1.00	$ 2,048.00	
	Concrete to separate Discharge Structures.	40	CY	$ 400.00	$ 16,000.00	
	Manhole	1	EA	$ 3,000.00	$ 3,000.00	
	Discharge Structures.	8	EA	$ 1,500.00	$ 12,000.00	
	4" Pressure Piping within Drying Bed	900	LF	$ 28.00	$ 25,200.00	
	4" Pressure Piping Out Side Drying Bed	400	LF	$ 28.00	$ 11,200.00	
	Valves	11	EA	$ 500.00	$ 5,500.00	
26	Packaged Lift Station Return from Drying Bed (e-one or equal) + Elec.	1	LS	$5,500.00	$5,500.00	
27	Sludge Collection Sump Pumps Within Anoxic Cells--Low Velocity	1	LS	$35,000.00	$35,000.00	
	Concrete Sump within Anoxic Cells	1	LS	$4,000.00	$4,000.00	
	3PH Electrical	1	LS	$3,000.00	$3,000.00	
	Force Main Piping to Sludge Holding Tank	600	LF	$28.00	$16,800.00	
	Valves	4	LS	$500.00	$2,000.00	
28	Sludge Collection Sump Pumps Within Anarobic Cells--Low Velocity	1	LS	$35,000.00	$35,000.00	
	Concrete Sump within Anarobic Cells	1	LS	$4,000.00	$4,000.00	
	3 PH Electrical	1	LS	$3,000.00	$3,000.00	
	Force Main Piping to Sludge Holding Tank	600	LF	$28.00	$16,800.00	
	Valves	4	LS	$500.00	$2,000.00	
29	Lift Station Return to Sludge Drying Beds-high velocity flow, Including sludge h	1	LS	$90,000.00	$90,000.00	
	Force Main Piping to Sludge Drying Beds	1000	LF	$28.00	$28,000.00	
	Valves	2	EA	$500.00	$1,000.00	
30	Influent Wastewater Screen	1	Each	$90,000.00	$90,000.00	
31	Return Flow from emergency bypass @ old chlorination cell to Aer. Cell 1 & 2					
	Retrofit existing pumps	1	LS	$50,000.00	$50,000.00	
	Piping	300	FT	$28.00	$8,400.00	
	Valves	4	EA	$500.00	$2,000.00	
32	Construction dewatering during construction Including: pumps, piping					
	Pipe (perf.)	1539	LF	$25.00	$38,475.00	
	Washed Rock	300	CY	$10.00	$3,000.00	
	Geofabric	12312	SF	$1.00	$12,312.00	
	Pipe, Washed Rock & Geofabric	1539	LF	$35.00	$53,865.00	
	Wet Well	1	LS	$3,000.00	$3,000.00	
	Sump Pump	1	LS	$15,000.00	$15,000.00	
	Eletrical	1	LS	$10,000.00	$10,000.00	

33	Yard piping-out side lagoons	1000	LF	$35.00	$35,000.00
	Valves Out side Lagoon	10	Ea	$500.00	$5,000.00
34	Access Road	1600	SY	$12.00	$19,200.00
35	Fencing	2200	LF	$12.00	$26,400.00
36	Extend Power to Site	1	LS	$10,000.00	$10,000.00
37	Emergency Power Generator	1	Each	$42,500.00	$42,500.00
38	Lab Equipment BOD5, TSS, Fecal, TP	1	LS	$50,000.00	$50,000.00
39	Stream Sampler : Samples for BOD5, TSS, Fecal, TP	1	QTY		
	Note: The Stream Sampler Will Auto sample for DO, PH				
	Effluent Sampler (Indoor) Sampler: Samples for BOD5, TSS, Fecal, TP	1	QTY		
	Note: The Effluent Sampler Will Auto sample for DO, PH				
	Influent Sampler: Sample for BOD5, TSS,	1	QTY		
	Note: The Influent Sampler Will Auto sample for DO, PH				
	Out Door Heaters for effluent & Influent Sampler	2	QTY		
	Flow Meter (980)	1	QTY		
	Sum:	1	LS		$23,500.00
37	Main Electrical & Control Pannel & Instrumentation	1	LS	$100,000.00	$100,000.00
38	Mixer in anarobic Cell	1	LS	$7,000.00	$7,000.00
39	Electrical	1	LS	$3,000.00	$3,000.00
40	Operations Building- Retrofit Existing	400	SF	$120.00	$48,000.00

Subtotal	$4,584,725.50
Sales Tax at 5%	$229,236.28
Land Purchase for irrigation area	$230,000.00
Subtotal	$5,043,961.78
Contingencies at 20%	$1,008,792.36
Subtotal	$6,052,754.13
Engineering at 20%	$1,210,550.83
Interest to fund Engineering, 1 Year at 5%	$60,527.54
Administrative and Legal	$228,236.28
Total	$7,552,068.77
Total - Engineering	$6,341,517.95

7.5m

Inflow/Infiltration Removal

Construction Subtotal	$873,900.00
Sales Tax at 5.0%	$43,695.00
Land Purchase	$0.00
Subtotal	$917,595.00
Contingencies at 10%	$91,759.50
Subtotal	$1,009,354.50
Engineering at 20%	$201,870.90
Interest to fund Engineering, 1 Year at 5%	$10,093.55
Administrative and Legal	$42,695.00
Total	$1,264,013.95
Total-Engineering	$1,062,143.05

1.2m

Total Project

Construction Subtotal	$5,458,625.50
Sales Tax at 5.0%	$272,931.28
Land Purchase	$230,000.00
Subtotal	$5,961,556.78
Contingencies at 10%, I/I, 20% WWT	$1,100,551.86
Subtotal	$7,062,108.63
Engineering at 20%	$1,412,421.73
Interest to fund Engineering, 1 Year at 5%	$70,621.09
Administrative and Legal	$270,931.28
Total	$8,816,082.72
Total-Engineering	$7,403,660.99

Annual Operations and Maintenance Costs

No.	Description	Qty	Units	Unit Cost	Opinion of Probable Cost
1	**Class II Operator - 1**	**2080**	**Hours**	**$29.00**	**$60,320.00**
2	Sludge Disposal	1250	CY	$5.00	$6,250.00
3	Motor and Pump Maintenance @ 2%	1	LS	$10,930.00	$10,930.00
4	Electricity	209600	kWh	$0.07	$14,672.00
5	Analytical (BOD5, TSS, Fecal, TP)	1	LS	$5,000.00	$5,000.00
6	Miscellaneous Supplies	1	LS	$2,000.00	$2,000.00
	Subtotal				$99,172.00
	Contingencies at 20%				$19,834.40
	Subtotal				$119,006.40
	Administrative and Engineering Support@5%				**$5,950.32**
	Total				**$124,956.72**

WOW

Total Present Value

Present Value of Probable Construction Cost	at	4.00% ann. Inflation	$8,816,082.72
	at	4.00% ann. Inflation	**$1,698,202.60**
Present Value of Probable Operations and Maintenance Cost			
Total			$10,514,285.32

Table 2 W/ Tribe
City of Plummer, Idaho
WWTP Option 2 W/ Tribe
Package Biological Treatment with Extended Aeration and Activated Sludge--Mechanical Package Plant--Irrigation
Opinion of Probable Cost

No.	Description	Qty	Units	Unit Cost	Opinion of Probable Cost
1	Mobilization	1	LS	$154,000.00	$154,000.00
3	Site Work	1	LS	$40,000.00	$40,000.00
4	Preparation Earthwork On Site	5000	CY	$10.00	$50,000.00
5	Haul & Place Crush Material	3000	CY	$20.00	$60,000.00
6	Mechanical Influent Wastewater Bar Screen	1	LS	$90,000.00	$90,000.00
7	Electrical	1	LS	$3,000.00	$3,000.00
8	Influent Lift Station, Including Generator & Controls.	1	LS	$120,000.00	$120,000.00
	Electrical	1	LS	$3,000.00	$3,000.00
9	Piping From Lift Station to Mechanical Building	500	LF	$28.00	$14,000.00
10	Gravity Piping to Existing Cell #2 for Equilization	400	LF	$28.00	$11,200.00
11	Equalization Basin-Excavation, Compaction & Backfill	9680	CY	$10.00	$96,800.00
12	Equalization Basin-Liner	459000	SF	$1.00	$459,000.00
13	Equalization Basin - Piping	200	LF	$28.00	$5,600.00
14	Equalization Basin Valving	4	EA	$500.00	$2,000.00
15	Sludge Dredging and Disposal	12404	CY	$15.00	$186,060.00
	Of Existing Cell 1 Aeration & Cell 2 Aeration				
16	Return Flow from equalization basin to Mechanical Package Plant				
	Retrofit existing pumps	1	LS	$50,000.00	$50,000.00
	Piping	300	FT	$28.00	$8,400.00
	Valves	4	EA	$500.00	$2,000.00
17	Mechanical Package Plant	1	LS	$815,400.00	$815,400.00
	Anoxic Tank				
	Aerobic Tank				
	Anaerobic Tank				
	Aerobic Tank				
	Clarifier Tank				
	Aerobic Digester				
18	Sand Filter for phosphorus Removal	1		$195,000.00	$195,000.00
19	Ultra-Violet Light Disinfection and pH Adjustment	1	LS	$105,000.00	$105,000.00
21	Existing Irrigation field (Retrofit Piping & Irrigation Equipment for Equilization)	1	LS	$20,000.00	$20,000.00
22	New Irrigation field (Retrofit Piping & Irrigation Equipment for Equilization)	1	LS	$65,000.00	$65,000.00
23	Solids Handling Drying Bed				
	Excavation, compaction & debris removal	2378	CY	$ 15.00	$ 35,670.00
	Piping -Perf. (Gravity to Packaged Lift Station)	326	LF	$ 25.00	$ 8,150.00
	Drain Rock	40	CY	$ 10.00	$ 400.00
	Sand @ 6" of depth.	1189	CY	$ 17.50	$ 20,807.50
	Geofabric	2048	SF	$ 1.00	$ 2,048.00
	Liner	2048	SF	$ 1.00	$ 2,048.00
	Concrete to separate Discharge Structures.	40	CY	$ 400.00	$ 16,000.00
	Manhole	1	EA	$ 3,000.00	$ 3,000.00
	Discharge Structures.	8	EA	$ 1,500.00	$ 12,000.00
	4" Pressure Piping within Drying Bed	900	LF	$ 28.00	$ 25,200.00
	4" Pressure Piping Out Side Drying Bed	400	LF	$ 28.00	$ 11,200.00
	Valves	11	EA	$ 500.00	$ 5,500.00
24	Packaged Lift Station Return from Drying Bed (e-one or equal) + Elec. To Mech. Plant	1	LS	$5,500.00	$5,500.00
25	Yard Piping from Mechanical Building to Sludge Drying Beds	200	FT	$28.00	$5,600.00
26	Fencing	2000	LF	$15.00	$30,000.00
27	Extend Power to Site	1	LS	$10,000.00	$10,000.00
28	Electrical and Instrumentation Controls	1	LS	$40,000.00	$40,000.00
29	Mechanical Package Plant Building	2500	SF	$120.00	$300,000.00
30	Pilot Study	1	LS	$60,000.00	$60,000.00
31	Lab Equipment BOD5, TSS, Fecal, TP	1	LS	$50,000.00	$50,000.00
32	Stream Sampler : Samples for BOD5, TSS, Fecal, TP	1	QTY		
	Note: The Stream Sampler Will Auto sample for DO, PH				
	Effluent Sampler (Indoor) Sampler: Samples for BOD5, TSS, Fecal, TP	1	QTY		
	Note: The Effluent Sampler Will Auto sample for DO, PH				
	Influent Sampler: Sample for BOD5, TSS,	1	QTY		
	Note: The Influent Sampler Will Auto sample for DO, PH				
	Out Door Heaters for effluent & Influent Sampler	2	QTY		
	Flow Meter (980)	1	QTY		
	Sum:	1	LS		$23,500.00
33	Power & Electrical for influent, effluent & indoor sampler	1	LS	$10,000.00	$10,000.00
	Subtotal				$3,232,083.50
	Sales Tax at 5.0%				$161,604.18
	Land Purchase for Mechanical Treatment Plant				$30,000.00
	Land Purchase for Irrigation Equilization (23 Acres)				$230,000.00
	Subtotal				$3,423,687.68
	Contingencies at 20%				$684,737.54
	Subtotal				$4,108,425.21
	Engineering at 20%				$821,685.04
	Interest to fund Engineering, 1 Year at 5%				$41,084.25

opt 1 is $1.6m
why $0.56m here

Administrative and Legal	$160,604.18
Total	$5,131,798.68
Total-Engineering	$4,310,113.64

Inflow/Infiltration Removal

Construction Subtotal	$873,900.00
Sales Tax at 5.0%	$43,695.00
Land Purchase	$0.00
Subtotal	$917,595.00
Contingencies at 10%	$91,759.50
Subtotal	$1,009,354.50
Engineering at 20%	$201,870.90
Interest to fund Engineering, 1 Year at 5%	$10,093.55
Administrative and Legal	$42,695.00
Total	$1,264,013.95
Total-Engineering	$1,062,143.05

Total Project

Construction Subtotal	$4,105,983.50
Sales Tax at 5.0%	$205,299.18
Land Purchase	$260,000.00
Subtotal	$4,341,282.68
Contingencies at 10%, I/I, 20% WWT	$776,497.04
Subtotal	$5,117,779.71
Engineering at 20%	$1,023,555.94
Interest to fund Engineering, 1 Year at 5%	$51,177.80
Administrative and Legal	$203,299.18
Total	**$6,395,812.62**

Annual Operations and Maintenance Costs

No.	Description	Qty	Units	Unit Cost	Opinion of Probable Cost
1	Class II Operator - 3/4 FTE	1560	Hours	$29.00	$45,240.00
2	Sludge Disposal	1250	CY	$5.00	$6,250.00
3	Motor and Pump Maintenance @ 2%	1	LS	$4,310.00	$4,310.00
4	Electricity	209600	kWh	$0.07	$14,672.00
5	Analytical (BOD5, TSS, Fecal, TP)	1	LS	$5,000.00	$5,000.00
6	Replacement UV	50	Each	$20.00	$1,000.00
7	Miscellaneous Supplies	1	LS	$4,000.00	$4,000.00
	Subtotal				$80,472.00
	Contingencies at 20%				$16,094.40
	Subtotal				$96,566.40
	Administrative and Engineering Support@5%				**$4,828.32**
	Total				**$101,394.72**

Total Present Value

Present Value of Probable Construction Cost	at	4.00% ann. Inflation	$6,395,812.62
	at	4.00% ann. Inflation	$1,377,987.33
Present Value of Probable Operations and Maintenance Cost			
Total			$7,773,799.96

Table 3
City of Plummer, Idaho
WWTP Alternative #3
Biological Treatment- Faciltative Lagoon, Total Containment
Opinion of Probable Cost

No.	Description	Qty	Units	Unit Cost	Opinion of Probable Cost
1	Mobilization	1	LS	$55,000.00	$55,000.00
2	Mechanical Influent Wastewater Bar Screen	1	LS	$80,000.00	$80,000.00
3	Influent Lift Station, Including Generator & Controls.	1	LS	$105,000.00	$105,000.00
4	Extend Electrical to site:	1	LS	$15,000.00	$15,000.00
5	Sludge Dredging and Disposal	1	LS	$200,000.00	$200,000.00
6	Yard Piping	1	LS	$5,000.00	$5,000.00
7	Containment Lagoon Excavation	2666667	CY	$14.00	$37,333,333.33
8	Containment lagoon Import Fill	666666.7	SY	$4.00	$2,666,666.67
9	Containment Lagoon Liner	18036008	LS	$1.00	$18,036,008.00
10	Effluent Sampler (Indoor) Sampler: Samples for BOD5, TS!	1	QTY		
	Note: The Effluent Sampler Will Auto sample for DO, PH				
	Influent Sampler: Sample for BOD5, TSS,	1	QTY		
	Note: The Influent Sampler Will Auto sample for DO, PH				
	Out Door Heaters for effluent & Influent Sampler	2	QTY		
	Flow Meter (980)	1	QTY		
	Sum:	1	LS		$18,700.00
11	Power & Electrical for influent Sampler	1	LS		
	Subtotal				$58,514,708.00
	Sales Tax at 5.0%				$2,925,735.40
	Land Purchase for Total Containment Area	1	LS	240000	$240,000.00
	Subtotal				$61,680,443.40
	Contingencies at 20%				$12,336,088.68
	Subtotal				$74,016,532.08
	Engineering at 20%				$14,803,306.42
	Interest to fund Engineering, 1 Year at 5%				$740,165.32
	Administrative and Legal				$2,924,735.40
	Total				$92,484,739.22
	Total-Engineering				$77,681,432.80

Annual Operations and Maintenance Costs

No.	Description	Qty	Units	Unit Cost	Opinion of Probable Cost
1	Class I Operator - 1/2	1040	Hours	$29.00	$30,160.00
2	Sludge Disposal	1250	CY	$5.00	$6,250.00
3	Motor and Pump Maintenance @ 2%	1	LS	$2,100.00	$2,100.00
4	Electricity	71428.57	kWh	$0.07	$5,000.00
5	Analytical (BOD5, TSS)	1	LS	$0.00	$0.00
6	Miscellaneous Supplies	1	LS	$4,000.00	$4,000.00
	Subtotal				$47,510.00
	Contingencies at 20%				$9,502.00
	Subtotal				$57,012.00
	Administrative and Engineering Support@5%				$2,850.60
	Total				$59,862.60

Total Present Value

Present Value of Probable Construction Cost	at	4.00% ann. Inflation	$92,484,739.22
Present Value of Probable Operations and Maintenance Cost	at	4.00% ann. Inflation	$813,552.27
Total			$93,298,291.48

Option 4 W/ Tribe
City of Plummer, Idaho
WWTP Option 4 W/Tribe
Biological Treatment with Extended Aeration and Activated Sludge in Modified Lagoons-Cascading
Opinion of Probable Cost

No.	Description	Qty	Units	Unit Cost	Opinion of Probable Cost
1	Mobilization	1	LS	$111,000.00	$111,000.00
2	Retrofit Existing Cells (Piping, etc)	650	LF	$28.00	$18,200.00
	Anoxic C1, 2-New. Aer. C1,				
3	Sludge Dredging and Disposal	12770	CY	$15.00	$191,550.00
	Anoxic C1, 2-New. Aer. C1,				
4	Impermeable Membrane Liner, existing & new cells	94158	SF	$1.00	$94,158.00
	Anoxic C1&2, New. Aer. C1&2, Anarobic C1&2				
5		1	LS	$218,000.00	$218,000.00
	Aeration Diffusers, Blower Equipment with Sound Attenuation, and Installation				
6	Baffle Curtains	1	LS	$87,350.00	$87,350.00
7	**Cascading Wet Land**	**1**	**LS**	**$ 507,000.00**	**$ 507,000.00**
8	**Solids** Handling Drying Bed				
	Excavation, compaction & debris removal	2378	CY	$ 15.00	$ 35,670.00
	Piping -Perf. (Gravity to Packaged Lift Station)	326	LF	$ 25.00	$ 8,150.00
	Drain Rock	40	CY	$ 10.00	$ 400.00
	Sand @ 6" of depth.	1189	CY	$ 17.50	$ 20,807.50
	Geofabric	2048	SF	$ 1.00	$ 2,048.00
	Liner	2048	SF	$ 1.00	$ 2,048.00
	Concrete to separate Discharge Structures.	40	CY	$ 400.00	$ 16,000.00
	Manhole	1	EA	$ 3,000.00	$ 3,000.00
	Discharge Structures.	8	EA	$ 1,500.00	$ 12,000.00
	4" Pressure Piping within Drying Bed	900	LF	$ 28.00	$ 25,200.00
	4" Pressure Piping Out Side Drying Bed	400	LF	$ 28.00	$ 11,200.00
	Valves	11	EA	$ 500.00	$ 5,500.00
9	Packaged Lift Station Return from Drying Bed (e-one or equal) + Elec.	1	LS	$5,500.00	$5,500.00
10	Sludge Collection Sump Pumps Within Anoxic Cells--Low Velocity	1	LS	$35,000.00	$35,000.00
	Concrete Sump within Anoxic Cells	1	LS	$4,000.00	$4,000.00
	3PH Electrical	1	LS	$3,000.00	$3,000.00
	Force Main Piping to Sludge Holding Tank	600	LF	$28.00	$16,800.00
	Valves	4	LS	$500.00	$2,000.00
11	Sludge Collection Sump Pumps Within Anarobic Cells--Low Velocity	1	LS	$35,000.00	$35,000.00
	Concrete Sump within Anarobic Cells	1	LS	$4,000.00	$4,000.00
	3 PH Electrical	1	LS	$3,000.00	$3,000.00
	Force Main Piping to Sludge Holding Tank	600	LF	$28.00	$16,800.00
	Valves	4	LS	$500.00	$2,000.00
12	Lift Station Return to Sludge Drying Beds-high velocity flow, Including sludge holding tank	1	LS	$90,000.00	$90,000.00
	Force Main Piping to Sludge Drying Beds	600	LF	$28.00	$16,800.00
	Valves	2	EA	$500.00	$1,000.00
13	Influent Wastewater Screen	1	Each	$90,000.00	$90,000.00
14	Return Flow from old Areation Cell 2 to Cascading Wet Land				
	Retrofit existing pumps to pump to Cascading Wet Land	1	LS	$50,000.00	$50,000.00
	Piping	300	FT	$28.00	$8,400.00
	Valves	4	EA	$500.00	$2,000.00
15	Yard piping-out side lagoons	500	LF	$35.00	$17,500.00
	Valves Out side Lagoon	10	Ea	$500.00	$5,000.00
16	Access Road	1600	SY	$12.00	$19,200.00
17	Fencing	5933	LF	$12.00	$71,196.00
18	Extend Power to Site	1	LS	$10,000.00	$10,000.00
19	Emergency Power Generator	1	Each	$42,500.00	$42,500.00
20	Lab Equipment BOD5, TSS, Fecal, TP	1	LS	$50,000.00	$50,000.00
21	Effluent Sampler (Indoor) Sampler: Samples for BOD5, TSS, Fecal, TP	1	QTY		
	Note: The Effluent Sampler Will Auto sample for DO, PH				
	Influent Sampler: Sample for BOD5, TSS,	1	QTY		
	Note: The Influent Sampler Will Auto sample for DO, PH				
	Out Door Heaters for effluent & Influent Sampler	2	QTY		
	Flow Meter (980)	1	QTY		
	Sum:	1	LS		$15,500.00
22	Main Electrical & Control Pannel & Instrumentation	1	LS	$80,000.00	$80,000.00
23	Ultra-Violet Light Disinfection and pH Adjustment	1	LS	$105,000.00	$105,000.00
24	Mixer in anarobic Cell	1	LS	$7,000.00	$7,000.00
25	Electrical	1	LS	$3,000.00	$3,000.00
26	Operations Building- Retrofit Existing	400	SF	$120.00	$48,000.00

Subtotal	$2,228,477.50
Sales Tax at 5%	$111,423.88
Subtotal	$2,339,901.38
Contingencies at 20%	$467,980.28
Subtotal	$2,807,881.65
Engineering at 20%	$561,576.33

Interest to fund Engineering, 1 Year at 5%	$28,078.82
Administrative and Legal	$110,423.88
Total	$3,507,960.67
Total - Engineering	$2,946,384.34

Inflow/Infiltration Removal

Construction Subtotal	$873,900.00
Sales Tax at 5.0%	$43,695.00
Land Purchase	$0.00
Subtotal	$917,595.00
Contingencies at 10%	$91,759.50
Subtotal	$1,009,354.50
Engineering at 20%	$201,870.90
Interest to fund Engineering, 1 Year at 5%	$10,093.55
Administrative and Legal	$42,695.00
Total	$1,264,013.95
Total-Engineering	$1,062,143.05

Total Project

Construction Subtotal	$873,900.00
Sales Tax at 5.0%	$2,272,172.50
Land Purchase	$0.00
Subtotal	$3,257,496.38
Contingencies at 10%, I/I, 20% WWT	$559,739.78
Subtotal	$3,817,236.15
Engineering at 20%	$763,447.23
Interest to fund Engineering, 1 Year at 5%	$38,172.36
Administrative and Legal	$153,118.88
Total	$4,771,974.62
Total-Engineering	$4,008,527.39

Annual Operations and Maintenance Costs

No.	Description	Qty	Units	Unit Cost	Opinion of Probable Cost
1	**Class II Operator - 1**	2080	Hours	$29.00	$60,320.00
2	Sludge Disposal	1250	CY	$5.00	$6,250.00
3	Motor and Pump Maintenance @ 2%	1	LS	$7,270.00	$7,270.00
4	Electricity	209600	kWh	$0.07	$14,672.00
5	Analytical (BOD5, TSS, Fecal, TP)	1	LS	$5,000.00	$5,000.00
6	Miscellaneous Supplies	1	LS	$2,000.00	$2,000.00
	Subtotal				$95,512.00
	Contingencies at 20%				$19,102.40
	Subtotal				$114,614.40
	Administrative and Engineering Support@5%				$5,730.72
	Total				$120,345.12

Total Present Value

Present Value of Probable Construction Cost	at	4.00% ann. Inflation	$4,771,974.62
Present Value of Probable Operations and Maintenance Cost	at	4.00% ann. Inflation	$1,635,529.45
Total			$6,407,504.07

Option 5 W/ Tribe
City of Plummer, Idaho
WWTP Option 5 W/ Tribe
Aeration in Modified Lagoons-Subsurface Irrigated Dripline
Opinion of Probable Cost

No.	Description	Qty	Units	Unit Cost	Opinion of Probable Cost
1	Mobilization	1	LS	$133,000.00	$133,000.00
2	Retrofit Existing Cells (Piping, etc)	650	LF	$28.00	$18,200.00
	Anoxic C1, 2-New. Aer. C1,				
3	Sludge Dredging and Disposal	12770	CY	$15.00	$191,550.00
	Anoxic C1, 2-New. Aer. C1,				
4	Impermeable Membrane Liner, existing & new cells	94158	SF	$1.00	$94,158.00
	Anoxic C1&2, New. Aer. C1&2, Anarobic C1&2				
5		1	LS	$218,000.00	$218,000.00
	Aeration Diffusers, Blower Equipment with Sound Attenuation, and Installation				
6	Baffle Curtains	1	LS	$87,350.00	$87,350.00
7	**Irrigated Drip**	**1**	**LS**	**$ 1,200,000.00**	**$ 1,200,000.00**
8	**Solids** Handling Drying Bed				
	Excavation, compaction & debris removal	2378	CY	$ 15.00	$ 35,670.00
	Piping -Perf. (Gravity to Packaged Lift Station)	326	LF	$ 25.00	$ 8,150.00
	Drain Rock	40	CY	$ 10.00	$ 400.00
	Sand @ 6" of depth.	1189	CY	$ 17.50	$ 20,807.50
	Geofabric	2048	SF	$ 1.00	$ 2,048.00
	Liner	2048	SF	$ 1.00	$ 2,048.00
	Concrete to separate Discharge Structures.	40	CY	$ 400.00	$ 16,000.00
	Manhole	1	EA	$ 3,000.00	$ 3,000.00
	Discharge Structures.	8	EA	$ 1,500.00	$ 12,000.00
	4" Pressure Piping within Drying Bed	900	LF	$ 28.00	$ 25,200.00
	4" Pressure Piping Out Side Drying Bed	400	LF	$ 28.00	$ 11,200.00
	Valves	11	EA	$ 500.00	$ 5,500.00
9	Packaged Lift Station Return from Drying Bed (e-one or equal) + Elec.	1	LS	$5,500.00	$5,500.00
10	Sludge Collection Sump Pumps Within Anoxic Cells--Low Velocity	1	LS	$35,000.00	$35,000.00
	Concrete Sump within Anoxic Cells	1	LS	$4,000.00	$4,000.00
	3PH Electrical	1	LS	$3,000.00	$3,000.00
	Force Main Piping to Sludge Holding Tank	600	LF	$28.00	$16,800.00
	Valves	4	LS	$500.00	$2,000.00
11	Sludge Collection Sump Pumps Within Anarobic Cells--Low Velocity	1	LS	$35,000.00	$35,000.00
	Concrete Sump within Anarobic Cells	1	LS	$4,000.00	$4,000.00
	3 PH Electrical	1	LS	$3,000.00	$3,000.00
	Force Main Piping to Sludge Holding Tank	600	LF	$28.00	$16,800.00
	Valves	4	LS	$500.00	$2,000.00
12	Lift Station Return to Sludge Drying Beds-high velocity flow, Including sludge holding tanl	1	LS	$90,000.00	$90,000.00
	Force Main Piping to Sludge Drying Beds	600	LF	$28.00	$16,800.00
	Valves	2	EA	$500.00	$1,000.00
13	Influent Wastewater Screen	1	Each	$90,000.00	$90,000.00
14	Return Flow from old Areation Cell 2 to Irrigation Drip				
	Retrofit existing pumps to pump to Cascading Wet Land	1	LS	$50,000.00	$50,000.00
	Piping	300	FT	$28.00	$8,400.00
	Valves	4	EA	$500.00	$2,000.00
15	Yard piping-out side lagoons	500	LF	$35.00	$17,500.00
	Valves Out side Lagoon	10	Ea	$500.00	$5,000.00
16	Access Road	1600	SY	$12.00	$19,200.00
17	Fencing	2200	LF	$12.00	$26,400.00
18	Extend Power to Site	1	LS	$10,000.00	$10,000.00
19	Emergency Power Generator	1	Each	$42,500.00	$42,500.00
20	Lab Equipment BOD5, TSS, Fecal, TP	1	LS	$50,000.00	$50,000.00
21	Effluent Sampler (Indoor) Sampler: Samples for BOD5, TSS, Fecal, TP	1	QTY		
	Note: The Effluent Sampler Will Auto sample for DO, PH				
	Influent Sampler: Sample for BOD5, TSS,	1	QTY		
	Note: The Influent Sampler Will Auto sample for DO, PH				
	Out Door Heaters for effluent & Influent Sampler	2	QTY		
	Flow Meter (980)	1	QTY		
	Sum:	1	LS		$15,500.00
22	Main Electrical & Control Pannel & Instrumentation	1	LS	$80,000.00	$80,000.00
23	Mixer in anarobic Cell	1	LS	$7,000.00	$7,000.00
24	Electrical	1	LS	$3,000.00	$3,000.00
25	Operations Building- Retrofit Existing	400	SF	$120.00	$48,000.00

Subtotal	$2,793,681.50
Sales Tax at 5%	$139,684.08
Land Purchase for irrigation area	$230,000.00
Subtotal	$3,163,365.58
Contingencies at 20%	$632,673.12
Subtotal	$3,796,038.69

Engineering at 20%	$759,207.74
Interest to fund Engineering, 1 Year at 5%	$37,960.39
Administrative and Legal	$138,684.08
Total	$4,731,890.89
Total - Engineering	$3,972,683.15

Inflow/Infiltration Removal

Construction Subtotal	$873,900.00
Sales Tax at 5.0%	$43,695.00
Land Purchase	$0.00
Subtotal	$917,595.00
Contingencies at 10%	$91,759.50
Subtotal	$1,009,354.50
Engineering at 20%	$201,870.90
Interest to fund Engineering, 1 Year at 5%	$10,093.55
Administrative and Legal	$42,695.00
Total	$1,264,013.95
Total-Engineering	$1,062,143.05

Total Project

Construction Subtotal	$3,667,581.50
Sales Tax at 5.0%	$183,379.08
Land Purchase	$230,000.00
Subtotal	$4,080,960.58
Contingencies at 10%, I/I, 20% WWT	$724,432.62
Subtotal	$4,805,393.19
Engineering at 20%	$961,078.64
Interest to fund Engineering, 1 Year at 5%	$48,053.93
Administrative and Legal	$181,379.08
Total	$5,995,904.83
Total-Engineering	$5,034,826.20

Annual Operations and Maintenance Costs

No.	Description	Qty	Units	Unit Cost	Opinion of Probable Cost
1	Class II Operator - 1	2080	Hours	$29.00	$60,320.00
2	Sludge Disposal	1250	CY	$5.00	$6,250.00
3	Motor and Pump Maintenance @ 2%	1	LS	$7,270.00	$7,270.00
4	Electricity	209600	kWh	$0.07	$14,672.00
5	Analytical (BOD5, TSS, Fecal, TP)	1	LS	$5,000.00	$5,000.00
6	Miscellaneous Supplies	1	LS	$2,000.00	$2,000.00
	Subtotal				$95,512.00
	Contingencies at 20%				$19,102.40
	Subtotal				$114,614.40
	Administrative and Engineering Support@5%				$5,730.72
	Total				$120,345.12

Total Present Value

Present Value of Probable Construction Cost	at	4.00% ann. inflation	$5,995,904.83
Present Value of Probable Operations and Maintenance Cost	at	4.00% ann. inflation	$1,635,529.45
Total			$7,631,434.29

Table 6 W/ Tribe
City of Plummer, Idaho
WWTP Option 6 W/ Tribe
Package Biological Treatment with Extended Aeration and Activated Sludge—Mechanical Package Plant (Drip Irrigation)
Opinion of Probable Cost

No.	Description	Qty	Units		Unit Cost		Opinion of Probable Cost
1	Mobilization	1	LS		$195,000.00		$195,000.00
3	Site Work	1	LS		$40,000.00		$40,000.00
4	Preparation Earthwork On Site	5000	CY		$10.00		$50,000.00
5	Haul & Place Crush Material	3000	CY		$20.00		$60,000.00
6	Mechanical Influent Wastewater Bar Screen	1	LS		$90,000.00		$90,000.00
7	Electrical	1	LS		$3,000.00		$3,000.00
8	Influent Lift Station, Including Generator & Controls.	1	LS		$120,000.00		$120,000.00
	Electrical	1	LS		$3,000.00		$3,000.00
9	Piping From Lift Station to Mechanical Building	500	LF		$28.00		$14,000.00
10	Gravity Piping to Existing Cell #2 for Equilization	400	LF		$28.00		$11,200.00
11	Equalization Basin-Excavation, Compaction & Backfill	9680	CY		$10.00		$96,800.00
12	Equalization Basin-Liner	459000	SF		$1.00		$459,000.00
13	Equalization Basin - Piping	200	LF		$28.00		$5,600.00
14	Equalization Basin Valving	4	EA		$500.00		$2,000.00
15	Sludge Dredging and Disposal	12404	CY		$15.00		$186,060.00
	Of Existing Cell 1 Aeration & Cell 2 Aeration						
16	Return Flow from equalization basin to Mechanical Package Plant						
	Retrofit existing pumps	1	LS		$50,000.00		$50,000.00
	Piping	300	FT		$28.00		$8,400.00
	Valves	4	EA		$500.00		$2,000.00
17	Mechanical Package Plant	1	LS		$815,400.00		$815,400.00
	Anoxic Tank						
	Aerobic Tank						
	Anaerobic Tank						
	Aerobic Tank						
	Clarifier Tank						
	Aerobic Digester						
22	Drip Line	1	LS		$1,200,000.00		$1,200,000.00
23	Solids Handling Drying Bed						
	Excavation, compaction & debris removal	2378	CY	$	15.00	$	35,670.00
	Piping -Perf. (Gravity to Packaged Lift Station)	326	LF	$	25.00	$	8,150.00
	Drain Rock	40	CY	$	10.00	$	400.00
	Sand @ 6" of depth.	1189	CY	$	17.50	$	20,807.50
	Geofabric	2048	SF	$	1.00	$	2,048.00
	Liner	2048	SF	$	1.00	$	2,048.00
	Concrete to separate Discharge Structures.	40	CY	$	400.00	$	16,000.00
	Manhole	1	EA	$	3,000.00	$	3,000.00
	Discharge Structures.	8	EA	$	1,500.00	$	12,000.00
	4" Pressure Piping within Drying Bed	900	LF	$	28.00	$	25,200.00
	4" Pressure Piping Out Side Drying Bed	400	LF	$	28.00	$	11,200.00
	Valves	11	EA	$	500.00	$	5,500.00
24	Packaged Lift Station Return from Drying Bed (e-one or equal) + Elec. To Mı	1	LS		$5,500.00		$5,500.00
25	Yard Piping from Mechanical Building to Sludge Drying Beds	200	FT		$28.00		$5,600.00
26	Fencing	2000	LF		$15.00		$30,000.00
27	Extend Power to Site	1	LS		$10,000.00		$10,000.00
28	Electrical and Instrumentation Controls	1	LS		$40,000.00		$40,000.00
29	Mechanical Package Plant Building	2500	SF		$120.00		$300,000.00
30	Pilot Study	1	LS		$60,000.00		$60,000.00
31	Lab Equipment BOD5, TSS, Fecal, TP	1	LS		$50,000.00		$50,000.00
32	Effluent Sampler (Indoor) Sampler: Samples for BOD5, TSS, Fecal, TP	1	QTY				
	Note: The Effluent Sampler Will Auto sample for DO, PH						
	Influent Sampler: Sample for BOD5, TSS,	1	QTY				
	Note: The Influent Sampler Will Auto sample for DO, PH						
	Out Door Heaters for effluent & Influent Sampler	2	QTY				
	Flow Meter (980)	1	QTY				
	Sum:	1	LS				$15,500.00
33	Power & Electrical for influent, effluent & indoor sampler	1	LS		$10,000.00		$10,000.00
	Subtotal						$4,080,083.50
	Sales Tax at 5.0%						$204,004.18
	Land Purchase for Mechanical Treatment Plant						$30,000.00
	Land Purchase for Irrigation Equilization (23 Acres)						$230,000.00
	Subtotal						$4,314,087.68
	Contingencies at 20%						$862,817.54

Subtotal	$5,176,905.21
Engineering at 20%	$1,035,381.04
Interest to fund Engineering, 1 Year at 5%	$51,769.05
Administrative and Legal	$203,004.18
Total	$6,467,059.48
Total-Engineering	$5,431,678.44

Inflow/Infiltration Removal

Construction Subtotal	$873,900.00
Sales Tax at 5.0%	$43,695.00
Land Purchase	$0.00
Subtotal	$917,595.00
Contingencies at 10%	$91,759.50
Subtotal	$1,009,354.50
Engineering at 20%	$201,870.90
Interest to fund Engineering, 1 Year at 5%	$10,093.55
Administrative and Legal	$42,695.00
Total	$1,264,013.95
Total-Engineering	$1,062,143.05

Total Project

Construction Subtotal	$4,953,983.50
Sales Tax at 5.0%	$247,699.18
Land Purchase	$260,000.00
Subtotal	$5,231,682.68
Contingencies at 10%, I/I, 20% WWT	$954,577.04
Subtotal	$6,186,259.71
Engineering at 20%	$1,237,251.94
Interest to fund Engineering, 1 Year at 5%	$61,862.60
Administrative and Legal	$245,699.18
Total	$7,731,073.42
Total-Engineering	$6,493,821.48

Annual Operations and Maintenance Costs

No.	Description	Qty	Units	Unit Cost	Opinion of Probable Cost
1	Class II Operator - 1/2 FTE	1040	Hours	$29.00	$30,160.00
2	Sludge Disposal	1250	CY	$5.00	$6,250.00
3	Motor and Pump Maintenance @ 2%	1	LS	$4,310.00	$4,310.00
4	Electricity	209600	kWh	$0.07	$14,672.00
5	Analytical (BOD5, TSS, Fecal, TP)	1	LS	$3,500.00	$3,500.00
6	Replacement UV	50	Each	$20.00	$1,000.00
7	Miscellaneous Supplies	1	LS	$4,000.00	$4,000.00
	Subtotal				$63,892.00
	Contingencies at 20%				$12,778.40
	Subtotal				$76,670.40
	Administrative and Engineering Support@5%				$3,833.52
	Total				$80,503.92

Total Present Value

Present Value of Probable Construction Cost	at	4.00% ann. Inflation	$7,731,073.42
	at	4.00% ann. Inflation	$1,094,074.54
Present Value of Probable Operations and Maintenance Cost			
Total			$8,825,147.97

Table 7 W/ Tribe
City of Plummer, Idaho
WWTP Option 7 W/ Tribe
Package Biological Treatment with Extended Aeration and Activated Sludge--Cascading Overland
Opinion of Probable Cost

No.	Description	Qty	Units	Unit Cost		Opinion of Probable Cost	
1	Mobilization	1	LS		$133,000.00		$133,000.00
2	Site Work	1	LS		$40,000.00		$40,000.00
3	Preparation Earthwork On Site	5000	CY		$10.00		$50,000.00
4	Haul & Place Crush Material	3000	CY		$20.00		$60,000.00
5	Mechanical Influent Wastewater Bar Screen	1	LS		$90,000.00		$90,000.00
6	Electrical	1	LS		$3,000.00		$3,000.00
7	Influent Lift Station, Including Generator & Controls.	1	LS		$120,000.00		$120,000.00
	Electrical	1	LS		$3,000.00		$3,000.00
8	Piping From Lift Station to Mechanical Building	500	LF		$28.00		$14,000.00
9	Mechanical Package Plant	1	LS		$815,400.00		$815,400.00
	Anoxic Tank						
	Aerobic Tank						
	Anaerobic Tank						
	Aerobic Tank						
	Clarifier Tank						
	Aerobic Digester						
10	**Cascading Wet Land**	1	LS		**$507,000.00**		**$507,000.00**
11	Solids Handling Drying Bed						
	Excavation, compaction & debris removal	2378	CY	$	15.00	$	35,670.00
	Piping -Perf. (Gravity to Packaged Lift Station)	326	LF	$	25.00	$	8,150.00
	Drain Rock	40	CY	$	10.00	$	400.00
	Sand @ 6" of depth.	1189	CY	$	17.50	$	20,807.50
	Geofabric	2048	SF	$	1.00	$	2,048.00
	Liner	2048	SF	$	1.00	$	2,048.00
	Concrete to separate Discharge Structures.	40	CY	$	400.00	$	16,000.00
	Manhole	1	EA	$	3,000.00	$	3,000.00
	Discharge Structures.	8	EA	$	1,500.00	$	12,000.00
	4" Pressure Piping within Drying Bed	900	LF	$	28.00	$	25,200.00
	4" Pressure Piping Out Side Drying Bed	400	LF	$	28.00	$	11,200.00
	Valves	11	EA	$	500.00	$	5,500.00
12	Packaged Lift Station Return from Drying Bed (e-one or equal) +	1	LS		$5,500.00		$5,500.00
13	Yard Piping from Mechanical Building to Sludge Drying Beds	200	FT		$28.00		$5,600.00
14	Fencing	5733	LF		$15.00		$85,995.00
15	Extend Power to Site	1	LS		$10,000.00		$10,000.00
16	Electrical and Instrumentation Controls	1	LS		$40,000.00		$40,000.00
17	Mechanical Package Plant Building	2500	SF		$120.00		$300,000.00
18	Pilot Study	1	LS		$60,000.00		$60,000.00
19	Lab Equipment BOD5, TSS, Fecal, TP	1	LS		$50,000.00		$50,000.00
20	Ultra-Violet Light Disinfection and pH Adjustment	1	LS		$105,000.00		$105,000.00
21	Effluent Sampler (Indoor) Sampler: Samples for BOD5, TSS, Fec	1	QTY				
	Note: The Effluent Sampler Will Auto sample for DO, PH						
	Influent Sampler: Sample for BOD5, TSS,	1	QTY				
	Note: The Influent Sampler Will Auto sample for DO, PH						
	Out Door Heaters for effluent & Influent Sampler	2	QTY				
	Flow Meter (980)	1	QTY				
	Sum:	1	LS				$15,500.00
22	Power & Electrical for influent, effluent & indoor sampler	1	LS		$10,000.00		$10,000.00
	Subtotal						$2,665,018.50
	Sales Tax at 5.0%						$133,250.93
	Land Purchase for Mechanical Treatment Plant						$30,000.00
	Subtotal						$2,828,269.43
	Contingencies at 20%						$565,653.89
	Subtotal						$3,393,923.31
	Engineering at 20%						$678,784.66
	Interest to fund Engineering, 1 Year at 5%						$33,939.23
	Administrative and Legal						$132,250.93
	Total						$4,238,898.13
	Total-Engineering						$3,560,113.47

Inflow/Infiltration Removal

Construction Subtotal	$873,900.00
Sales Tax at 5.0%	$43,695.00
Land Purchase	$0.00
Subtotal	$917,595.00
Contingencies at 10%	$91,759.50
Subtotal	$1,009,354.50
Engineering at 20%	$201,870.90
Interest to fund Engineering, 1 Year at 5%	$10,093.55
Administrative and Legal	$42,695.00
Total	$1,264,013.95
Total-Engineering	$1,062,143.05

Total Project

Construction Subtotal	$3,538,918.50
Sales Tax at 5.0%	$176,945.93
Land Purchase	$30,000.00
Subtotal	$3,745,864.43
Contingencies at 10%, I/I, 20% WWT	$657,413.39
Subtotal	$4,403,277.81
Engineering at 20%	$880,655.56
Interest to fund Engineering, 1 Year at 5%	$44,032.78
Administrative and Legal	$174,945.93
Total	$5,502,912.08
Total-Engineering	$4,622,256.51

Annual Operations and Maintenance Costs

No.	Description	Qty	Units	Unit Cost	Opinion of Probable Cost
1	**Class II Operator - 1/2 FTE**	**1040**	**Hours**	**$29.00**	**$30,160.00**
2	Sludge Disposal	1250	CY	$5.00	$6,250.00
3	Motor and Pump Maintenance @ 2%	1	LS	$4,310.00	$4,310.00
4	Electricity	209600	kWh	$0.07	$14,672.00
5	Analytical (BOD5, TSS, Fecal, TP)	1	LS	$3,500.00	$3,500.00
6	Replacement UV	50	Each	$20.00	$1,000.00
7	Miscellaneous Supplies	1	LS	$4,000.00	$4,000.00
	Subtotal				$63,892.00
	Contingencies at 10%				$6,389.20
	Subtotal				$70,281.20
	Administrative and Engineering Support@5%				$3,514.06
	Existing O&M on Collection System				$0.00
	Total				$73,795.26

Total Present Value

Present Value of Probable Construction Cost	at	4.00% ann. Inflation	$5,502,912.08
	at	4.00% ann. Inflation	$1,002,901.67
Present Value of Probable Operations and Maintenance Cost			
Total			$6,505,813.74

APPENDIX VII

1982 NPDES Permit

U.S. ENVI' .NMENTAL PROTECTION A ENCY
REGION X
1200 SIXTH AVENUE
SEATTLE, WASHINGTON 98101

REPLY TO ATTN OF: Mail Stop 521

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

AUG 3 1 1982

Honorable Harold Whitley
Mayor of Plummer
P.O. Box B
Plummer, Idaho 83851

Re: Administrative Modification of NPDES Permit No.: ID-002278-1

Dear Mayor Whitley:

It has been brought to our attention that some minor corrections are needed in the permit which we recently issued for your sewage treatment plant discharge to clarify the wording in the effluent limitations. Consequently, we have made these changes in your permit.

Attached are copies of the modified pages of your permit covering the changes.

Sincerely,

Robert S. Burd
Director, Water Division

Enclosures

cc: Idaho Operations Office
Idaho Department of Health and Welfare
Idaho Department of Health and Welfare, Coeur d'Alene Field Office

U.S. ENVIRONMENTAL PROTECTION AGENCY
REGION X
1200 SIXTH AVENUE
SEATTLE, WASHINGTON 98101

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REPLY TO ATTN OF: Mail Stop 521

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

AUG 18 1982

Honorable Harold Whitley
Mayor of Plummer
P.O. Box B
Plummer, Idaho 83851

Re: Reissuance of NPDES Permit No.: ID-002278-1

Dear Mayor Whitley:

The Environmental Protection Agency (EPA) has made the determination to reissue a National Pollutant Discharge Elimination System (NPDES) permit covering the discharge from your sewage treatment facility. This permit incorporates effluent limitations which must be complied with to satisfy the secondary waste treatment requirements and State of Idaho water quality standards.

Attached is your official copy of the reissued permit which demonstrates that your facility is duly authorized to discharge into Lake Chatcolet via Plummer Creek subject to certain specified requirements.

Since there were no comments received during the public notice period, the new permit is effective as of this date.

Sincerely,

Robert S. Burd

Robert S. Burd
Director, Water Division

Enclosure

cc: Idaho Operations Office
Idaho Dept. of Health & Welfare
Idaho Dept. of Health & Welfare, Coeur d'Alene Field Office

Permit No.: ID-002278-1
Application No.: ID-002278-1

AUTHORIZATION TO DISCHARGE UNDER THE

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

In compliance with the provisions of the Federal Water Pollution Control Act, as amended, (33 U.S.C. §1251 et seq; the "Act"),

City of Plummer

is authorized to discharge from a facility located in Plummer, Idaho to receiving waters named Lake Chatcolet via Plummer Creek in accordance with discharge point(s), effluent limitations, monitoring requirements and other conditions set forth herein.

This permit shall become effective August 18, 1982.

This permit and the authorization to discharge shall expire at midnight, August 17, 1987.

Signed this 18th day of August 1982.

Robert S. Burd

Director, Water Division - Region X
U.S. Environmental Protection Agency

This permit administratively modified effective this 31st day of August 1982.

Robert S. Burd

Director, Water Division - Region X
U.S. Environmental Protection Agency

I.A. EFFLUENT LIMITATIONS, MONITORING REQUIREMENTS AND COMPLIANCE SCHEDULE

1. Effluent Limitations - December through April

During the period beginning on the effective date of this permit and lasting until the expiration date, discharges from outfalls shall be limited and monitored by the permittee as specified below:

a. The monthly average quantity of effluent discharged from the wastewater treatment facility shall not exceed 380 cmd (0.10 mgd).

b. The pH shall not be less than 6.5 nor greater than 9.0.

c. There shall be no discharge of floating solids or visible foam other than in trace amounts.

d. The following limitations and monitoring requirements shall apply:

Effluent Characteristics	Unit of Measurement	Monthly Average	Weekly Average
Effluent Concentrations			
Biochemical Oxygen Demand (5-day)	mg/l	30	45
Suspended Solids	mg/l	30	45
Fecal Coliform Bacteria	No./100 ml	100	200
Effluent Loadings			
Biochemical Oxygen Demand (5-day)	kg/day (lb/day)	12(26)	18(39)
Suspended Solids	kg/day (lb/day)	12(26)	18(39)

Monitoring Requirements	Unit of Measurement	Sampling Frequency	Type of Sample
Total Flow	cmd (mgd)	5/week	Grab
Biochemical Oxygen Demand (5-day)	mg/l	Monthly	Grab
Suspended Solids	mg/l	Monthly	Grab
pH	pH Units	Weekly	Grab
Fecal Coliform Bacteria	No./100 ml	Monthly	Grab

This page administratively modified August 31, 1982.

85% Removal: The monthly average effluent concentrations shall not exceed 15% of the monthly average influent concentrations for Biochemical Oxygen Demand (5-day) (BOD_5) and Suspended Solids (SS) collected at approximately the same times during the same period (85% removal).

Influent BOD_5 and SS samples shall be monitored according to the effluent monitoring requirements for these parameters and at approximately the same times during the same period.

The percent BOD_5 and SS removal shall be reported on each monthly Discharge Monitoring Report form.

2. Effluent Limitations - May through November

During the period beginning on the effective date of this permit and lasting until the expiration date, no discharges from outfalls are allowed between May 1 and November 30, inclusive.

This page administratively modified August 31, 1982.

I.B. MONITORING AND REPORTING REQUIREMENTS

1. Representative Sampling

Samples and measurements taken as required shall be representative of the volume and nature of the monitored discharge. The permittee shall take samples and measurements to meet the monitoring requirements specified. Samples shall be taken in the effluent stream before its discharge to the receiving water, at the specific locations identified in Part A of this permit.

2. Reporting

a. Discharge Monitoring Reports

Monitoring results shall be summarized each month on a Discharge Monitoring Report Form (EPA No. 3320-1). These reports for the previous month shall be submitted monthly and are to be postmarked by the 10th day of the month following the end of the reporting period. Duplicate signed copies of these, and all other reports, shall be submitted to the Director, Water Division and the State agency at the following addresses:

United States Environmental Protection Agency
Region 10
1200 Sixth Avenue
Seattle, Washington 98101

Attn: Water Compliance Section M/S 513

State of Idaho
Department of Health and Welfare
Division of Environment
Statehouse
Boise, Idaho 83720

3. Definitions

a. The "monthly average", other than for fecal coliform bacteria, is the arithmetic mean of samples collected during a calendar month. The monthly average for fecal coliform bacteria is the geometric mean of samples collected during a calendar month.

b. The "weekly average", other than for fecal coliform bacteria, is the arithmetic mean of samples collected during a calendar week. The weely average for fecal coliform bacteria is the geometric mean of samples collected during a calendar week.

II. GENERAL REQUIREMENTS

A. Duty to Comply

1. The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Clean Water Act and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or for denial of a permit renewal application. The permittee shall also comply with any effluent standards or prohibitions established under Section 307(a) of the Clean Water Act for toxic pollutants within the time provided in the regulations that establish these standards or prohibitions, even if the permit has not yet been modified to incorporate the requirement.

2. The Clean Water Act provides that any person who violates a permit condition implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the Clean Water Act is subject to a civil penalty not to exceed $10,000 per day of such violation. Any person who willfully or negligently violates permit conditions implementing Sections 301, 302, 306, 307, or 308 of the Clean Water Act is subject to a fine of not less than $2,500 nor more than $25,000 per day of violation, or by imprisonment for not more than 1 year, or both.

B. Duty to Reapply

If the permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the permittee must apply for and obtain a new permit. Application must be made at least 180 days prior to the expiration date of this permit.

C. Need to Halt or Reduce Activity not a Defense

It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit. Upon reduction, loss or failure of the treatment facility, the permittee shall, to the extent necessary to maintain compliance with its permit, control production or all discharges or both until the facility is restored or an alternative method of treatment is provided. This requirement applies, for example, when the primary source of power of the treatment facility fails or is reduced or lost.

D. Duty to Mitigate

The permittee shall take all reasonable steps to minimize or correct any adverse impact on the environment resulting from noncompliance with this permit.

E. Duty to Provide Information

The permittee shall furnish to the Director, within a reasonable time, any information which the Director may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with this permit. The permittee shall also furnish to the Director, upon request, copies of records required to be kept by this permit.

F. Inspection and Entry

The permittee shall allow the Director, or an authorized representative, upon the presentation of credentials and other documents as may be required by law to:

1. Enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit;

2. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;

3. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and

4. Sample or monitor at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by the Clean Water Act, any substances or parameters at any location.

G. Monitoring and Records

1. Samples taken in compliance with the monitoring requirements established under Part I shall be collected from the effluent stream prior to discharge into the receiving waters. Samples and measurements shall be representative of the volume and nature of the monitored discharge.

2. Monitoring must be conducted according to test procedures approved under 40 CFR Part 136, unless other test procedures have been specified in this permit.

3. The Clean Water Act provides that any person who falsifies, tampers with or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both.

4. The permittee shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least 3 years from the date of the sample, measurement, report or application. This period may be extended by request of the Director at any time.

5. Records of monitoring information shall include:

a. The date, exact place, and time of sampling or measurements;

b. The individual(s) who performed the sampling or measurements;

c. The date(s) analyses were performed;

d. The individual(s) who performed the analyses;

e. The analytical techniques or methods used; and

f. The results of such analyses.

H. Reporting Requirements

1. Discharge Monitoring Reports

a. Monitoring results shall be summarized each month on a Discharge Monitoring Report form (DMR; EPA No. 3320-1). The reports shall be submitted monthly and are to be postmarked by the 10th day of the following month. Duplicate copies of these, and all other reports herein, shall be signed and certified in accordance with the requirements of I., Signatory Requirements, and submitted to the Director, Water Division and the State agency at the following addresses:

United States Environmental Protection Agency
Region 10
1200 Sixth Avenue
Seattle, WA 98101

Attn: Water Compliance Section, Mail Stop 513

State of Idaho
Department of Health and Welfare
Division of Environment
Statehouse
Boise, ID 83720

b. Additional monitoring. If the permittee monitors any pollutant more frequently than required by the permit, using test procedures approved under 40 CFR 136, the results of such monitoring shall be included in the calculation and reporting of the data submitted in the DMR.

2. Noncompliance Reporting

a. The permittee shall report any noncompliance which may endanger health or the environment. Any information shall be provided orally within 24 hours from the time the permittee becomes aware of the circumstances. A written submission shall also be provided within 5 days of the time the permittee becomes aware of the circumstances. The written submission shall contain:

(i) A description of the noncompliance and its cause;

(ii) The period of noncompliance, including exact dates and times;

(iii) The estimated time noncompliance is expected to continue if it has not been corrected; and

(iv) Steps taken or planned to reduce, eliminate, and prevent recurrence of the noncompliance.

b. The following occurrences must be reported under paragraph a above:

(i) Any unanticipated bypass which exceeds any effluent limitation in the permit. (See Section K below).

(ii) Any upset which exceeds any effluent limitation in the permit. (See Section L below)

(iii) Violation of a maximum daily discharge limitation for any of the pollutants listed by the Director in the permit to be reported within 24 hours.

c. Anticipated noncompliance. The permittee shall give advance notice to the Director of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.

d. Other noncompliance. The permittee shall report all instances of noncompliance not reported under paragraphs 1., a., b. and c. of this section, at the time monitoring reports are submitted. The reports shall contain the information listed in paragraph a. of this section.

3. Planned Changes. The permittee shall give notice to the Director as soon as possible of any planned physical alterations or additions to the permitted facility.

4. Notice of New Introduction of Pollutants. The permittee shall provide adequate notice to the Director, Water Division of:

a. Any new introduction of pollutants into the treatment works from an indirect discharger which would be subject to Sections 301 or 306 of the Act if it were directly discharging those pollutants; and

b. Any substantial change in the volume or character of pollutants being introduced into the treatment works by a source introducing pollutants into the treatment works at the time of issuance of the permit.

Adequate notice shall include information on:

(i) The quality and quantity of effluent to be introduced into such treatment works; and

(ii) Any anticipated impact of the change on the quantity or quality of effluent to be discharged from such publicly owned treatment works.

5. Other Information. When the permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or any report to the Director, it shall promptly submit such facts or information.

6. Availability of Reports. Except for data determined to be confidential under Section 308 of the Clean Water Act, all reports prepared in accordance with the terms of this permit shall be available for public inspection at the office of the state water pollution control agency and the Director, Water Division. As required by the Act, effluent data shall not be considered confidential.

I. Signatory Requirements

1. Applications. All permit applications shall be signed by either a principal executive officer or ranking elected official.

2. Reports. All reports required by this permit and other information requested by the Director shall be signed by a person described in paragraph 1. of this section, or by a duly authorized representative of that person. A person is a duly authorized representative only if:

a. The authorization is made in writing by a person described in paragraph 1. of this section;

b. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of plant manager, superintendent, or position of equivalent responsibility. (A duly authorized representative may thus be either a named individual or any individual occupying a named position.); and

c. The written authorization is submitted to the Director.

3. Changes to authorization. If an authorization under paragraph 2. of this section is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of paragraph 2. of this section must be submitted to the Director prior to or together with any reports, information or applications to be signed by an authorized representative.

4. Certification. Any person signing a document under paragraphs 1. or 2. of this section shall make the following certification:

"I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment."

5. The Clean Water Act provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or noncompliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both.

J. Proper Operation and Maintenance

The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance include effective performance, adequate funding, adequate operator staffing and training, and adequate laboratory and process controls, including appropriate quality assurance procedures.

K. Bypass

1. Definitions:

a. "Bypass" means the intentional diversion of waste streams from any portion of a treatment facility.

b. "Severe property damage" means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

2. Bypass not exceeding limitations. The permittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the provisions of paragraphs 3 and 4 which immediately follow.

3. Notification:

a. Anticipated bypass. If the permittee knows in advance of the need for a bypass, he shall submit prior notice, if possible at least 10 days before the date of the bypass.

b. Unanticipated bypass. The permittee shall submit notice of an unanticipated bypass within 24 hours of becoming aware of the circumstances as required under H.2 above.

4. Prohibition of bypass. Bypass is prohibited, and the Director may take enforcement action against a permittee for bypass, unless:

a. Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;

b. There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if the permittee could have installed adequate backup equipment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance; and

c. The permittee submitted notices as required under paragraph 3. a above, and the bypass has been approved by the Director.

L. Upset

1. Definition: "Upset" means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

2. Effect of an Upset. An upset constitutes an affirma- tive defense to an action brought for noncompliance with technology-based permit effluent limitations if the requirements of paragraph 3 below are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review.

3. Conditions necessary for a demonstration of upset. A permittee who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:

a. An upset occurred and that the permittee can identify the specific cause(s) of the upset;

b. The permitted facility was at the time being properly operated; and

c. The permittee submitted notice of the upset as required under H.2 above.

d. The permittee complied with any remedial measures required under D. "Duty to Mitigate."

4. Burden of Proof. In any enforcement proceeding the permittee seeking to establish the occurrence of an upset has the burden of proof.

M. Control of Undesirable Pollutants

Under no circumstances shall the permittee allow introduction of the following wastes into the waste treatment system:

1. Wastes which will create a fire or explosion identify the specific cause(s) of the upset;

2. Wastes which will cause corrosive structural damage to treatment works, but in no case wastes with a pH lower than 5.0, unless the works is designed to accommodate such wastes.

3. Solid or viscous substances in amounts which cause obstructions to the flow in sewers, or interference with the proper operation of the treatment works.

4. Wastewaters at a flow rate and/or pollutant dis- charge rate which is excessive over relatively short time periods so that there is a treatment process upset and subsequent loss of treatment efficiency.

5. Any pollutant, including oxygen demanding pollut- ants (BOD, et.) released in a discharge of such volume or strength as to cause interference in the treatment works.

N. Requirements for Industrial Users

The permittee shall require any industrial user of these treatment works to comply with any applicable requirements of Sections 204(b), 307, and 308 of the Act, including any requirements established under 40 CFR Part 403.

O. Removed Substances

Collected screenings, grit, sludges, and other solids removed in the course of treatment or control of wastewaters shall be disposed of in a manner so as to prevent entry of those wastes or runoff from such materials into navigable waters unless otherwise authorized in this permit.

P. Permit Actions

This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance, does not stay any permit condition.

Q. Property Rights

This permit does not convey any property rights of any sort, or any exclusive privilege.

R. Severability

The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit shall not be affected thereby.

S. State Laws

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable state law or regulation under authority preserved by Section 510 of the Clean Water Act.

APPENDIX VIII

2002 WLAP Permit

STATE OF IDAHO
DEPARTMENT OF
ENVIRONMENTAL QUALITY

2110 Ironwood Parkway • Coeur d'Alene, Idaho 83814-2648 • (208) 769-1422

Dirk Kempthorne, Governor
C. Stephen Allred, Director

April 30, 2002

CERTIFIED RETURN RECEIPT 7000 1670 0005 6151 4755

The Honorable Jack Bringman
Mayor, City of Plummer
P.O. Box B
Plummer, ID 83851

RE: **Draft Wastewater Land Application Permit (WLAP) for the City of Plummer (#000004-02)**

Dear Mayor Bringman:

Enclosed please find a copy for you and for presentation to the members of the City Council of the draft Wastewater Land Application Permit that this office prepared as the result of a permit application submitted by the city in 1996. This permit is required by the Idaho Wastewater Land Application Permit Regulations when treated wastewater is applied to the land for treatment and disposal. With your receipt of the draft 13-page permit, the city has thirty (30) days to review and comment back to DEQ with anything in the draft permit that the city feels deserves modification, revision, or changing. Also enclosed is a copy of the 6-page staff analysis prepared to provide supporting documentation for the draft permit.

Please pay special attention to the Section G on page 6 of the draft permit. This section contains specific actions and compliance dates for the city to address system deficiencies. DEQ wants the city to determine whether any residence west of the irrigation field is too close and might have a well at risk. We want the city to immediately install three shallow piezometers at the low end of the irrigation field to monitor for saturated conditions. And we want the city to take steps to study and upgrade the wastewater disinfection system which has shown significant non-compliance with the bacteria standard from the previous permit and non-compliance with the current bacteria standards for wastewater systems with land application close to public access. It is important that the city understand these items and feels you can reasonably comply with the dates specified for each item.

Once you have provided DEQ with comments on the draft permit, we will resolve and/or incorporate your comments into the permit and then issue a new and final five-year WLAP for the Plummer wastewater system. We recommend that the city ask your engineering consultant to also review and comment to DEQ on the draft permit. **Prior to May 31, 2002, we will expect to receive comments on the draft permit from the city.** Please respond in writing to DEQ whether you have or do not have any comments.

Sincerely,

Gary J. Gaffney

Gary J. Gaffney, P.E.

Enclosure (Draft WLAP and Staff Analysis)

c: Jeffrey Logan, Wyatt Engineering, Inc., 1220 North Howard, Inc., Spokane, WA (w/enc)
Donna Spier, City Clerk, City of Plummer, P.O. Box B, Plummer, ID 83851

STATE OF IDAHO
DEPARTMENT OF
ENVIRONMENTAL QUALITY

2110 Ironwood Parkway • Coeur d'Alene, Idaho 83814-2648 • (208) 769-1422

Dirk Kempthorne, Governor
C. Stephen Allred, Director

April 30, 2002

MEMORANDUM

TO: Roger Tinkey, Regional Manager, Coeur d'Alene Regional Office
John Tindall, Coeur d'Alene Regional Office
Richard Huddleston, State Water Quality Office, Boise State Office

FROM: Gary Gaffney *GG.*

SUBJECT: **Draft Staff Analysis for the City of Plummer Wastewater Land Application Permit, LA-000004- 02 (Municipal Wastewater)**

PURPOSE

The purpose of this memorandum is to satisfy the requirements of IDAPA 58.01.17.700 for issuing wastewater-land application permits.

SUMMARY OF EVENTS

In 1989, the City of Plummer was issued a five-year Wastewater Land Application Permit (WLAP) when the Wastewater Land Application Permit Regulations were first adopted. The initial WLAPs were issued to existing facilities and allowed the city to continue with irrigation of treated wastewater as had been done since the practice was started in 1982. In 1996, the city applied for renewal of their WLAP and a draft permit was sent on August 6, 1996 by DEQ to the city for comments. No comments were received on the draft permit. However, DEQ failed issue the new permit at that time. The current WLAP is comparable to the 1997 draft but has been modified to be more relevant to the current operation. The operator has been submitting and DEQ-CdA has been reviewing and commenting on annual reports since 1996.

It is time to have this facility operating with a valid permit.

PROCESS DESCRIPTION

The City of Plummer operates a municipal wastewater treatment facility about one mile east of Highway 95 along Plummer Creek. The City presently serves a population of 990 consisting of approximately 400 sewer connections. In 1980 when the facility last underwent significant upgrading, the design capacity of the treatment facility was for a population of 700 with a 20-year design population of 1300. The treatment facility consists of gravity collection of whole sewage with delivery through a communitor to two surface-aerated lagoon cells with capacities of 5.7 million gallons (MG) and 3.9 MG. Wastewater from the second lagoon cell is disinfected with gas chlorine and delivered to a small contact lagoon. From the contact lagoon, wastewater is either pumped to the spray irrigation field or siphon dosed onto two intermittent sand filters with underdrains discharging to Plummer Creek per an existing but presently expired NPDES permit.

The NPDES permit only allows discharge to the creek from December 1 to May 1 while the old WLAP allows irrigation from June 1 to September 31st. During the months of November and May, neither discharge to Plummer

Creek or irrigation of the wastewater is allowed. This has caused the city problems in the past especially during wet years with high precipitation when the two aerated lagoons do not have sufficient capacity to hold the wastewater throughout the months of November or May. In these instances the city has discharged to Plummer Creek rather than overfill the lagoons.

The wastewater treatment system was last upgraded in 1981. In recent years, the City has undertaken a number of projects intended to improve the sewage collection system and reduce excessive inflow and infiltration (I/I) impacts. Excessive I/I has been identified by engineering reports as a major deficiency in this sewer system adversely affecting the treatment system performance. Reduction of excessive I/I has also been determined as the most cost-effective way to provide additional capacity in the system. In 2001, the city imposed a moratorium on construction requiring new sewer hookups and secured funding for a $350,000 project aimed at improving the sewage collection system.

DESCRIPTION OF WASTEWATER TREATMENT AND LAND APPLICATION SYSTEM

The irrigation property is a 30-acre city owned property about 2000 feet north of the treatment plant along a gravel county road. The property is fenced and is about ½ mile (2,616 feet) long by 500 feet wide and was equipped with a buried irrigation distribution system onto which individual sprinkler risers are attached. The land has been used for wastewater land application and has been farmed by individuals under contract with the city for oats and for hay crops during the past 20 years. A twenty-five (25) foot buffer zone was originally established in 1980 between the irrigation area and the road right-of-way. There is one small residence located across the county road from the property probably using an individual well and on-site septic tank and drainfield. Otherwise, there are no other homes or businesses within close proximity of the irrigation field.

The city grew alfalfa on the irrigation site for many years after the land application was started in the early 1980s. In recent years, the city has contracted with a local farmer to grow oats on the field. The farmer prepares the site, plants the seed, and harvests the crop. Cenex sprays for weeds on the crop. The city sells the crop and pays the farmer based a flat fee for his services. In 2001, 64,680 pounds of oats were harvested from the 27 acre site, netting the city $2737 for the oats and, when compared to expenses of $1617, resulted in a profit to the city of $1543 including a $423 in Dept. of Agriculture conservation payment.

The parcel is of gently rolling topography typical of the Palouse area. A timbered parcel and seasonally wet low area is located adjacent to the southern boundary. This area has been reported as being wet in the spring and is being equipped with three shallow piezometers that the operator will have to monitor. If these monitoring pipes have ground water within 36-inches of the surface, the permit prohibits the operator from land applying the wastewater until the area dries.

The force main from the two 50 Hp, 530-660 gpm capacity irrigation pumps located in the operations building next to the lagoons is a 10-inch diameter ductile iron line up to the field. At the irrigation field this line changes to an 8-inch PVC pipe off of which twenty-six (26) 4-inch diameter lateral lines at 100-foot spacings are installed. The irrigation laterals are all individually valved have sprinkler heads at 101-foot spacings.

SITE CHARACTERISTICS

Other agricultural fields surround the irrigation field and there is no evidence of nearby drinking water wells with the exception of the well serving the residence west of the property. There is little information about local geology or ground water conditions in the area of this field. The general landform in this area exhibits fine grained and relatively deep soils with lengthy time of travel to the ground water and low ground water recharge rates. The low permeability of the silt loam soils and irrigation application rate approximating the consumptive use of the crops suggests that ground water recharge from the wastewater land application system is minimal. Without a significant ground water mapping effort, it would be difficult to design an effective ground water monitoring system and might not be worth the effort because of the low infiltration rates associated with the soils.

PROJECTED WASTEWATER QUALITY AND LOADING RATES

WASTEWATER QUANTITY and QUALITY

Based on 2001 flow of 37.075 MG and 990 users, the average per capita wastewater flow is 103 gpd and the average daily flow is 101,575 gpd, which is within range of the system's design criteria. The following table shows the wastewater quality results from the Annual Report for the 2001 year:

Constituent/ Date	BOD (mg/l)	Suspended Solids (mg/l)	Total Coliform (Organisms/100ml)	Fecal Coliform (Organisms/100ml)
June, 2001	16	26	No Sample	300, 30, 80, 900
July, 2001	17	61	>1600, >1600, 220	50
August, 2001	28	76	1600, 80	4
September, 2001	No Sample	No Sample	No Sample	No Sample
October, 2001	10	52	>1600, 1600, >1600	No Sample
Design Goal	**10-25**	**15-25**	**23 or 230**	**NA**

As can be seen from the above table, the treatment levels were not consistently below the goals established by the system design but are close enough to suggest that land application of the wastewater does not pose a high risk to contaminating ground water. However, the failure of the system to meet the disinfection standard and the need to bring the system into compliance with a higher disinfection standard, makes upgrading the disinfection system at this facility a condition of the new WLAP.

With the new WLAP, only total coliform will be considered relevant when considering compliance with the disinfection standard. Although the irrigation site does not meet the current 230 guidelines for buffer zones of 300 feet from the edge of the irrigation field to public access and 1000 feet to inhabited dwellings but it is fenced and posted.

The permit will contain compliance items requiring the city to upgrade in a two year period the disinfection system to meet the 23/100 ml standard consistent with current guidance for a site close to a public road. This will involve an engineer studying the existing disinfection system and submitting plans and specifications for recommended improvements during the first year. The second year is given for the city to implement the improvements and achieve the required disinfection level.

With the new permit, it is proposed that the city substitute COD for BOD sampling, eliminate the suspended solids monitoring, and start sampling the wastewater for nitrogen and phosphorous concentrations. Permit limits for COD at the guidance level and for nitrogen and phosphorous at the uptake rate for the oat or grass hay crop were assigned. All of the three parameters when sampled in the city wastewater prior to land application are expected to be well below the guidance value and the crop uptake values.

HYDRAULIC LOADING RATES

The wastewater application period for this installation will be within the May 1st to October 31st period (184 days) based on the irrigated crop requirements for water. Wastewater land application will not be allowed when the ground is frozen or when shallow piezometers located at the low section of the field have water present any closer than three feet below ground surface (bgs). Wastewater land application during November 1st to April 30th will not be allowed.

The wastewater application rate for this site was established based on application of the guidance in the standard WLAP permit. This uses mean irrigation water requirements from consumptive use data from Tensed (Allen and Brockway 1983) for spring grain. No application is allowed during April because the site is typically not dry enough to irrigate until May. This determination assigned a 75% irrigation efficiency which resulted in 22.4-inch annual application rate between May and August. This will allow the city to apply up to 16.4 MGA on the 27 acres. The permit does not allow irrigation during September or October because the grain crop is harvested in early September. The city will need to determine whether they must irrigate during these two months in order to store wastewater until discharge to Plummer Creek is permitted.

The permit prohibits spray irrigating if there is ground water present in any of the three shall piezometers. This will prevent the city from land applying on saturated soils or contributing to site runoff due to saturated soils. Slow permeability of the silt loam soils will reduce the application rates even further and prevent the practice from approaching rates where ground water impacts might be suspected.

CONSTITUENT LOADING RATES

Constituent loading rates for COD shall conform to the guidelines shown in the State of Idaho *Handbook for Land Application of Municipal and Industrial Wastewater (Handbook)*. N loading rate shall be limited to crop uptake values and P loading shall be limited to the recommended 18% of the Total N uptake.

GROUND WATER CONSIDERATIONS

The land application site is in an agricultural area without any public water supply wells within 1000 feet. One non-public well may be supplying a nearby residence but there is no information pertaining to the depth and quality of water from this water well. The permit will require the city to submit a well log (if available) and nitrate and coliform bacteria sample results from this well and to resample the well for the same parameters during the third year of the five-year permit. Since ground water is not readily available in significant quantities, when found is commonly found at over 200 foot depths, and is overlaid with fine-grained material with a long travel time and low permeability, the risk to the ground water by this facility does not justify the installation of a ground water monitoring system.

The flow data in the last six annual reports (1995 to present) submitted by the city and in the below table show that the average annual collected wastewater has decreased from a maximum of 67.6 MG in 1997 to a low in 2001 of 37.1 MG. This may be attributed to efforts by the city to reconstruct the sewage collection system. The volume of wastewater land applied during these six years has been in the 11 to 13 MG range except in 1997 when 35.4 Mg was reported as being land applied for some unspecified reason. It is unlikely that the growth in the city during the next five year permit period will increase the volume needing land application much past the 13 to 15 MG amount. Any attempt to eliminate the NPDES discharge from Plummer Creek will require major study and funding of additional lagoon storage facilities and purchase of additional irrigation property. A permit revision would be needed in such a case.

Plummer Wastewater Flows

Year	Lagoon Influent	NPDES Discharge	Land Applied Wastewater	Lagoon Effluent	Unaccounted Wastewater	Unaccounted/ Influent
1996	43.1	28.3	12.5	40.8	2.3	5%
1997	67.6	30.5	35.4	65.9	1.7	2.5%
1998	58.7	25.0	14.5	39.5	19.2	32.7%
1999	42.5	17.7	13.1	30.8	11.7	27%
2000	40.7	17.1	13.3	30.4	10.3	25%
2001	37.1	21.1	11.3	32.4	4.7	12%

The possibility of the two lagoons leaking more than the 1/8th-inch per day standard is suggested because the lagoons are sealed using native clay and there has been unaccounted for annual wastewater volumes of 1.7 to 19.2 MGA. However, since the unaccounted for wastewater volume is not consistent and dropped significantly in 2001 to below the volume allowed by the 1/8th-inch per day standard, staff does not recommend seepage testing of the lagoons as part of the permitting process. If and when the city undertakes upgrading of the wastewater treatment plant now being proposed and likely to occur within 5 to 10 years, DEQ will require that the project includes installation of a liner in each of the lagoons.

BUFFER ZONES

Recommended buffer zones for a disinfection level of 23 and 230-organisms/100 ml as shown below are contained in the permit to remind the city that their irrigation site needs to be managed to minimize public exposure. The Plummer irrigation site is located 25 feet from a county rural gravel road and within 300 feet from a single residence and it's associated private water source. The property appears to exceed the buffer zone distances from streams and public water sources. Since the facility is not in compliance with the current disinfection buffer distances, the permit will require the city to upgrade the disinfection system to accomplish disinfection less than 23/100 ml. This is consistent with the location of the irrigation field within 25 feet from a public road.

Any new land application areas being developed by the city will need to comply with the current guidance, which calls for a disinfection level of 23-organisms/100 ml.

Disinfection Level for Total Coliform (TC)*	Distance to Public Access	Distances to Inhabited Dwellings	Distance to streams	Distance to Private water sources	Distance to Public water sources	Single Sample maximum TC
23/100 ml	50 feet	300 feet	50 feet	500	1000	240/100ml
230/100ml	300 feet	1,000 feet	50 feet	500	1000	2400/100ml

SITE SPECIFIC CONDITIONS

- The permit requires the city to install three shallow piezometers on the low end of the irrigation field and to monitor these piezometers for the presence of shallow ground water during the irrigation season and avoid land applying wastewater if there is water within three feet of the ground surface.
- The permit requires the city to submit information on a nearby private drinking water well and to sample the well in 2002 and 2005 for bacteria and nitrate contamination. While it is considered unlikely the city irrigation system has affected ground water and this well, staff feels it is important to sample the well for these two indicator parameters.
- The permit will require the operator to revise his annual reporting format to include new items required by the re-issued WLAP.

<u>RECOMMENDATION</u>: DEQ staff recommends issuance of the attached draft permit. This will provide the city with a current WLAP and upgrade the monitoring requirements to reflect current practices.

cc: WLAP Source File No. LA-000004-02

MUNICIPAL
WASTEWATER LAND APPLICATION PERMIT
LA-000004-02
City of Plummer

City of Plummer, P.O. Box B, Plummer, ID 83851, IS HEREBY AUTHORIZED TO CONSTRUCT, INSTALL AND OPERATE A WASTEWATER-LAND APPLICATION TREATMENT SYSTEM IN ACCORDANCE WITH THE WASTEWATER-LAND APPLICATION RULES (IDAPA 58.01.17), THE WATER QUALITY STANDARDS AND WASTEWATER TREATMENT REQUIREMENTS (IDAPA 58.01.02), AND THE GROUND WATER QUALITY RULE (IDAPA 58.01.11) AND ACCOMPANYING PERMIT, APPENDICES, AND REFERENCE DOCUMENTS. THIS PERMIT IS EFFECTIVE FROM THE DATE OF SIGNATURE AND EXPIRES FIVE YEARS FROM THE DATE OF SIGNATURE.

____

Gwen P. Fransen, Regional Administrator
Idaho Department of Environmental Quality

Signed this ____________day of_____________________, 2002

DEPARTMENT OF ENVIRONMENTAL QUALITY
2110 IRONWOOD PARKWAY
COEUR D'ALENE IDAHO 83814

(208) 769-1422
(208) 769-1404 FAX

POSTING ON SITE RECOMMENDED

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B. Permit Contents and Reference Documents

The Sections, Appendices, and Reference Documents listed on this page are all elements of Wastewater-Land Application Permit and are enforceable as such. This permit does not relieve the permittee from responsibility for compliance with other applicable federal, state or local laws, rules, standards or ordinances.

C. Facility Information

Legal Name of Permittee	City of Plummer
Type of Waste	Municipal wastewater
Method of Treatment	Slow Rate Irrigation on Agricultural Land
Type of Facility	Municipal
Site Acres	27 effective in a 30 acre city owned parcel
Facility Location	Plummer, Idaho
Legal Location	T46N, R4W, Section 8
County	Benewah
USGS Quad	Chatolet
Soils on Site	Taney silt loam (Soil Survey for Benewah County)
Depth to Ground Water	Greater than 100 feet to seasonal high ground water
Beneficial Uses of Ground Water	Agricultural, Drinking water
Nearest affected Surface Water	Plummer Creek, a tributary to Lake Chatolet and Lake Coeur d'Alene
Beneficial Uses of Surface Water	Agriculture
Facility Contact Persons **Mailing Address** **Phone/Fax Number**	Mayor, Jack Bringman or Donna Spier, City Clerk David Janson, Operator City of Plummer P.O. Box B Plummer, ID 83851 Phone 208/686-1641

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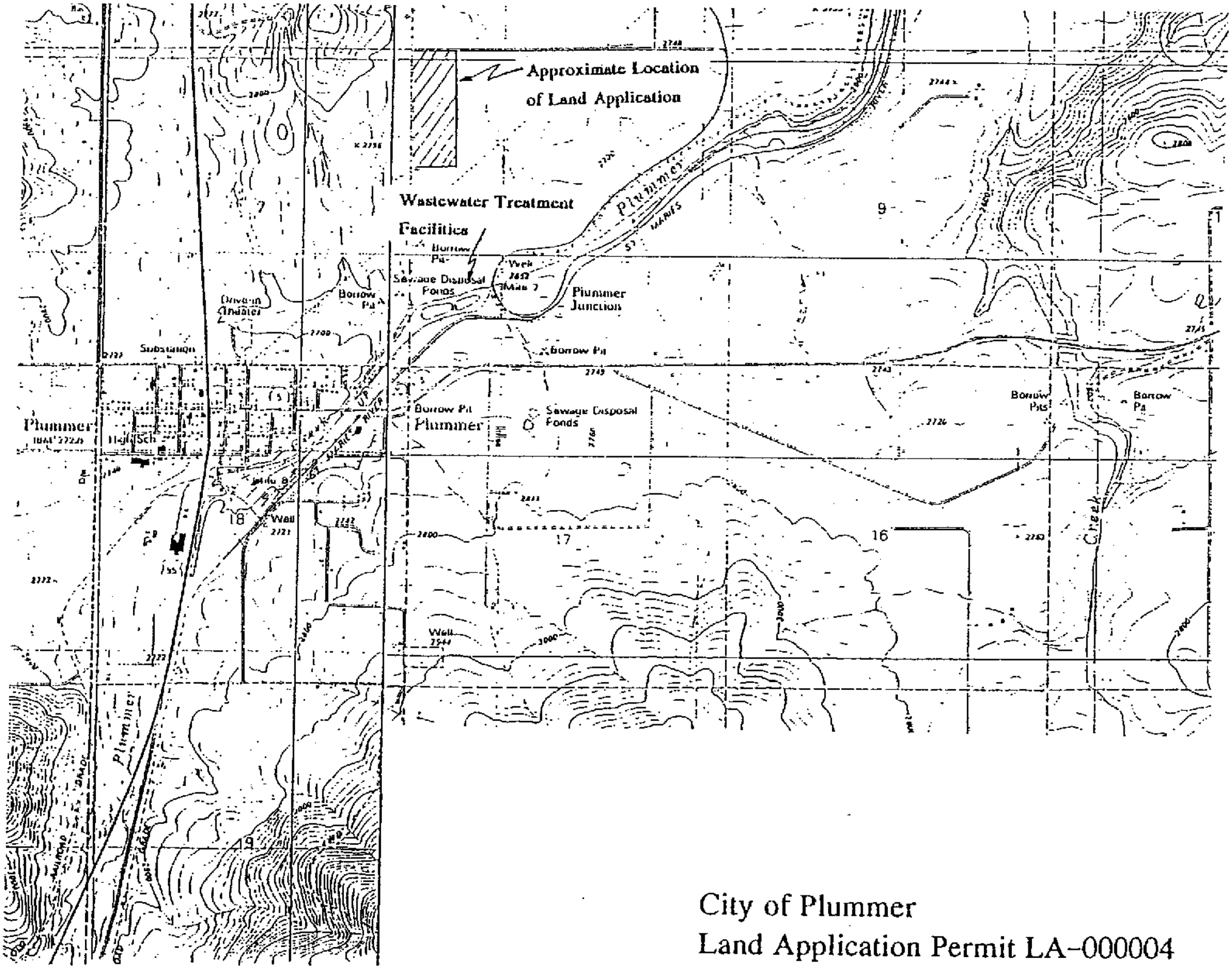
D. Site Map



City of Plummer
Land Application Permit LA-000004

E. Environmental Monitoring Serial Numbers

HYDRAULIC MANAGEMENT UNITS		
Description	**Acres**	**Serial No.**
30 Acre Irrigation Field	27	MU-0004-01

WASTEWATER SAMPLING POINTS	
Description	**Serial No.**
Discharge point of wastewater to land application	WW-0004-01

LAGOONS		
Description	**Location**	**Serial No.**
Lagoon 1 – Aerated with 3.9 MG capacity	Plant site	LG-0004-01
Lagoon 2 – Aerated with 5.7 MG capacity	Plant site	LG-0004-02

SOIL MONITORING UNITS		
Description	**Associated Hydraulic Unit**	**Serial No.**
Throughout 30 Acre Irrigation Field	MU-0004-01	SU-0004-01

GROUNDWATER MONITORING and PIEZOMETERS		
Description	**Location**	**Serial No.**
Three shallow ground water piezometers (See Appendix B)	South boundary of MU-0004-01	PZ-0004-01 PZ-0004-02 PZ-0004-03

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F. Reference Documents incorporated into the Permit

1. As-built plans and specifications for the City of Plummer, Idaho; Water Pollution Control Facilities 1980 – Wastewater Treatment System by H&V Engineering, Inc. dated 9/16/81 (EPA Project No. C-16 0199-02).

2. Operation and Maintenance Manual (August 1981) City of Plummer Water Pollution Control Facilities Wastewater Treatment System by H&V Engineering, Inc.

3. Wastewater – Land Application Permit Program Resource and Training Manual (September 1999). Available from DEQ-Boise.

4. "Estimating Consumptive Irrigation Requirements for Crops in Idaho" published in 1983 by R. G. Allen and C. E. Brockway. A Research Technical Completion Report submitted to Idaho Department of Water Resources.

G. Compliance Schedule For Required Activities

The Activities in the following table shall be completed on or before the Completion Date unless modified by the DEQ in writing.

Compliance Activity Number **Completion Date**	Compliance Activity Description
CA-00004-01 January 31, 2003	Revise the Annual Report to include Section J Facility Monitoring Schedule requirements. See Appendix A for guidance.
CA-000004-02 January 31, 2003 January 31, 2006	Submit a copy of the Well Driller's Report (Well log) and total coliform bacteria and nitrate sample results for any non-public drinking water well located within 500 feet of the perimeter of the irrigation field. Repeat the total coliform bacteria and nitrate sampling from these same well(s) and submit results with the 2005 Annual Report.
CA-00004-03 August 1, 2002	Install three 6-8-foot deep piezometers at the northern boundary of the WLAP for detection of saturated soil conditions prior to startup of irrigation. Monitor at least monthly for water depths in the three piezometers and report the data in the Annual Reports. See Appendix B for guidance.
CA-00004-04 August 1, 2003	Submit to DEQ an engineering analysis of the wastewater disinfection system and construction plans and specifications for improvements to the disinfection system necessary to consistently achieve a Total Coliform level of less than 23 organisms/100 ml. in land applied wastewater.
CA-00004-05 August 1, 2004	Complete construction of the improvements to the disinfection system necessary to achieve a Total Coliform standard of 23-organisms/100 ml in accordance with CA-00004-04.

H. Special Conditions - None

I. Standard Permit Limits and Conditions

1) The Permittee is allowed to apply wastewater and treat it on a land application site as prescribed in the tables below and in accordance with all other applicable permit conditions and schedules.

Category	Permitted Limits and Conditions
Type of Wastewater	Municipal Wastewater treated and discharged from the City of Plummer Wastewater Treatment Facility.
Application Site Area	Slow Rate Irrigation
Application Season and Restrictions	Growing Season only starting on May 1 and ending on October 31 No wastewater land application when piezometers detect groundwater within three feet of the ground surface.
Maximum Monthly Hydraulic Loading Rate Guidance	For Grain Crops: __Month__ __Application Rate (inches)__ __Application Volume (MG)__ May ....3.17..................................2.32 June........................ 7.33.................................5.37 July ....10.0................................7.34 August .... .1.6...... ....1.17 September.. October.. **Total 22.1 16.2** The monthly application rates are based on irrigation of spring grain, a 75% irrigation efficiency, and no irrigation during April. The application volume is based on even application to the 27 irrigated acres where one inch of wastewater is equal to 0.733 million gallons. For other crops, the city must provide for DEQ approval specific application rates and volumes based on irrigation needs of the crop.
Ground Water	No application to any areas with saturated soil or standing water at the surface. Ground Water Quality shall be in compliance with Idaho *Ground Water Quality Rule* IDAPA 58.01.11
Grazing	Grazing is not allowed.
Allowable crops	Crops grown for direct human consumption are not allowed.
Signing	Signs shall be posted and maintained every 500 feet designating the fields as wastewater reuse areas or equivalent.
Disinfection Standard	230 org./100ml until August 1, 2004; 23 org./100ml after August 1, 2004
COD, N, and P Loadings	Less than 50 lbs./acre/day, 150 lbs./acre, and 27 lbs./acre

Recommended Buffer Zone Distances	**Disinfection Level for Total Coliform (TC)***	**Distance to Public Access**	**Distances to Inhabited Dwellings**	**Distance to streams**	**Distance to Private Water Sources**	**Distance to public water sources**	**Single Sample maximum TC**
	23/100 ml	50 feet	300 feet	50 feet	500	1000	240/100ml
	230/100 ml.	300 feet	1,000 feet	50 feet	500	1000	2400/100ml

*Compliance determination method for the 230 / 100 ml disinfection level shall involve the median value of the last three (3) results not exceeding 230 /100 ml. In addition, no single sample value shall exceed 2400 / 100 ml.

J. Standard Monitoring Requirements

1) Appropriate analytical methods, as given in the *Handbook for Land Application of Municipal and Industrial Wastewater, April 1996*, or as approved by the Idaho Department of Environmental Quality (hereinafter referred to as DEQ), shall be employed
2) The permittee shall monitor and measure parameters as stated in the Facility Monitoring Schedule in this section. Samples shall be collected at times and locations that represent typical environmental and process parameters being monitored.
3) Monitoring locations are described in Section E. Environmental Monitoring Serial Numbers.
4) Monitoring is required at the frequency shown in the table below if wastewater is applied anytime during the time period shown.

Facility Monitoring Schedule

Frequency	Monitoring Point	Description and Type of Monitoring	Parameters
Monthly	Influent to Treatment Lagoons	Total Volume of Wastewater	Total Gallons received into the Treatment Facility/month
Monthly May through September	Flow meter on Irrigation Pump Discharge.	Total Volume of Wastewater land applied during the month.	Total Gallons & Inches Applied*
July and September	Sampling Tap after Irrigation Pump	Grab sample during irrigation.	Total nitrogen, COD, and total phosphorus
Twice per week when land applying from May through September	Discharge Point of Wastewater to Land Application Field	Grab sample during irrigation.	Total Coliform*** and Free Chlorine Residual
Annually	Irrigation Field	Acres used for land application	Acres
May through September during the first of the month	Three Piezometers	Distance below Ground Surface	Depth to Ground Water or No Water Present
Annually	Irrigation Field	COD, N, and P loading calculations	COD, total nitrogen and total Phosphorus in lbs/acre/year**
Annually	Irrigation Field	Crop Type and Yield	Pounds, Tons, or Bushels
October, 2003 and October, 2006	Irrigation Field	Composite Soil Sample****	Electrical Conductivity, nitrate-nitrogen, ammonium-nitrogen, plant available phosphorous, and pH

* To convert total gallons per month to inches applied on the 27-acre irrigation field, divide the number of gallons by 733,115. For example, 5,000,000 gallons applied in July would equal (5,000,000/733115) = 6.82 inches applied.

** To calculate pounds/ acre/year multiply the average concentration in mg/l (for COD, nitrogen, or phosphorous) times the volume of applied wastewater in million gallon (MG) times 8.34 and divide by 27 irrigated acres. For example, if the two nitrogen samples are 30 and 50 mg/l (averaging 40 mg/l) and 15 MG of wastewater was land applied, the nitrogen loading would be equal to (40 x 15 x 8.34)/27 = 185 pounds/acre/year.

*** Analysis for both total coliform and fecal coliform counts are acceptable for operating information but only total coliform results can be used to determine permit compliance. Any bacteria sample analyzed for just fecal coliform bacteria will not be considered towards permit compliance.

**** Five (5) soil sample locations shall be selected. Two (2) soil samples shall be collected at each sample location, one at 0-12 inches and the other at 12-24 inches. The soil samples collected at 0-12 inches from each sample location shall be composted. Similarly, all soil samples collected at 12-24 inches shall be composited. This method will yield two samples for analysis, one for 0-12 inches and one for 12-24 inches.

K. Standard Reporting Requirements

1. The permittee shall submit an Annual Wastewater-Land Application Site Performance Report ("Annual Report") prepared, signed, and dated by a competent environmental professional or certified wastewater treatment plant operator no later than January 31 of each year which shall cover the previous year from January 1 through December 31. The Annual Report shall include results for monitoring required in Section E, status of compliance activities, and an interpretive discussion of monitoring data results with particular respect to environmental impacts by the facility. See Appendix A for an outline of Annual Report content.

DRAFT

L. Standard Permit Conditions: Procedures and Reporting

1. The permittee shall at all times properly maintain and operate all structures, systems, and equipment for treatment, operational controls and monitoring, which are installed or used by the permittee to comply with all conditions of the permit or the Wastewater-Land Application Permit Regulations, in conformance with a DEQ approved, current Plan of Operations (Operations and Maintenance Manual) which describes in detail the operation, maintenance, and management of the wastewater treatment system. This Plan of Operations shall be updated as necessary to reflect current operations.

2. Wastewater(s) or recharge waters applied to the land surface must be restricted to the premises of the application site unless permission has been obtained from the DEQ authorizing a discharge into the waters of the State as stated in IDAPA 58.01.02.600.02.

3. Wastewater must not create a public health hazard or nuisance condition as stated in IDAPA 58.01.02.600.03. In order to prevent public health hazards and nuisance conditions the permittee shall:

a. Apply wastewater as evenly as practicable to the treatment area;
b. Prevent organic solids (contained in the wastewater) from accumulating on the ground surface to the point where the solids putrefy or support vectors or insects; and
c. Prevent wastewater from ponding in the fields to the point where the ponded wastewater putrefies or supports vectors or insects.

4. As a result of the land application of wastewater, ground water of the state must not contain contaminants exceeding those values as referenced under IDAPA 58.01.11.200a, b and c of the Ground Water Quality Rule, unless otherwise specified in this permit.

5. The permittee shall:

a. Manage the wastewater land application treatment site as an agronomic operation where vegetative cover is grown and harvested or grazed to utilize the nutrients and minerals in the wastewater, and,
b. Not hydraulically overload any particular areas of the wastewater land application treatment site.

6. All waste solids, including dredgings and sludges, shall be utilized or disposed in a manner which will prevent their entry, or the entry of contaminated drainage or leachate therefrom, into the waters of the state such that health hazards and nuisance conditions are not created; and to prevent impacts on designated beneficial uses of the ground water and surface water. The permittee's management of waste solids shall be governed by the terms of the DEQ approved Waste Solids Management Plan, which upon approval shall be an enforceable portion of this permit.

7. If the permittee intends to continue operation of the permitted facility after the expiration of an existing permit, the permittee shall apply for a new permit at least six months prior to the expiration date of the existing permit in accordance with the Waste Water Land Application Permit Regulations and include seepage tests on all lagoons per latest DEQ procedures.

8. The permittee shall allow the Director of the Idaho Department of Environmental Quality or the Director's designee (hereinafter referred to as Director), consistent with Title 39, Chapter 1, Idaho Code, to:

a. Enter the permitted facility,
b. Inspect any records that must be kept under the conditions of the permit.
c. Inspect any facility, equipment, practice, or operation permitted or required by the permit.
d. Sample or monitor for the purpose of assuring permit compliance, any substance or any parameter at the facility.

9. The permittee shall report to the Director under the circumstances and in the manner specified in this section:

a. In writing thirty (30) days before any planned physical alteration or addition to the permitted facility or activity if that alteration or addition would result in any significant change in information that was submitted during the permit application process.
b. In writing thirty (30) days before any anticipated change which would result in non-compliance with any permit condition or these regulations.
c. Orally within twenty-four (24) hours from the time the permittee became aware of any non-compliance which may endanger the public health or the environment at telephone numbers provided in the permit by the Director (see below)

DEQ Regional Office: see Permit Certification Page
Emergency 24 Hour Number 1-800-632-8000

d. In writing as soon as possible but within five (5) days of the date the permittee knows or should know of any non-compliance unless extended by the DEQ. This report shall contain:

i. A description of the non-compliance and its cause;
ii. The period of non-compliance including to the extent possible, times and dates and, if the non-compliance has not been corrected, the anticipated time it is expected to continue; and
iii. Steps taken or planned to reduce or eliminate reoccurrence of the non-compliance.

e. In writing as soon as possible after the permittee becomes aware of relevant facts not submitted or incorrect information submitted, in a permit application or any report to the Director. Those facts or the correct information shall be included as a part of this report.

10. The permittee shall take all necessary actions to prevent or eliminate any adverse impact on the public health or the environment resulting from permit noncompliance.

11. The permittee shall determine (on an on-going basis) if any noxious weed problems relate to the permitted sites. If problems are present, coordinate with the Idaho Department of Agriculture or the local County authority regarding their requirements for noxious weed control. Also address these control operations in an update to the Operations and Maintenance Manual.

M. Standard Permit Conditions: Modifications, Violations, and Revocations

1. The permittee shall furnish to the Director within reasonable time, any information including copies of records, which may be requested by the Director to determine whether cause exists for modifying, revoking, re-issuing, or terminating the permit, or to determine compliance with the permit or these regulations.

2. Both minor and major modifications may be made to this permit as stated in IDAPA 58.01.17.700.01 and 02 with respect to any conditions stated in this permit upon review and approval of the DEQ.

3. Whenever a facility expansion, production increase or process modification is anticipated which will result in a change in the character of pollutants to be discharged or which will result in a new or increased discharge that will exceed the conditions of this permit, or if it is determined by the DEQ that the terms or conditions of the permit must be modified in order to adequately protect the public health or environment, a request for either major or minor modifications must be submitted together with the reports as described in G. Reporting Requirements, and plans and specifications for the proposed changes. No such facility expansion, production increase or process modification shall be made until plans have been reviewed and approved by the DEQ and a new permit or permit modification has been issued.

4. Permits shall be transferable to a new owner or operator provided that the permittee notifies the Director by requesting a minor modification of the permit before the date of transfer.

5. Any person violating any provision of the Waste Water Land Application Permit Regulations, or any permit or order issued thereunder shall be liable for a civil penalty not to exceed ten thousand dollars ($10,000) or one thousand dollars ($1,000) for each day of a continuing violation, whichever is greater. In addition, pursuant to Title 39, Chapter 1, Idaho Code, any willful or negligent violation may constitute a misdemeanor.

6. The Director may revoke a permit if the permittee violates any permit condition or the Wastewater Land Application Permit Regulations.

7. Except in cases of emergency, the Director shall issue a written notice of intent to revoke to the permittee prior to final revocation. Revocation shall become final within twenty (20) days of receipt of the notice by the permittee, unless within that time the permittee request an administrative hearing in writing to the Director.

8. The Director shall notify the permittee in writing of any revocation hearing at least twenty (20) days prior to the date set for such hearing. The hearing shall be conducted in accordance with Title 67, Chapter 52, Idaho Code.

9. If, pursuant to Idaho Code § 67-5247, the Director finds the public health, safety or welfare requires emergency action, the Director shall incorporate findings in support of such action in a written notice of emergency revocation issued to the permittee. Emergency revocation shall be effective upon receipt by the permittee. Thereafter, if requested by the permittee in writing the Director shall provide the permittee a revocation hearing and prior notice thereof. Such hearings shall be conducted in accordance with Title 67, Chapter 52, Idaho Code.

10. The provisions of this permit are severable and if a provision or its application is declared invalid or unenforceable for any reason, that declaration will not affect the validity or enforceability of the remaining provisions.

11. The permittee shall notify the DEQ at least six (6) months prior to permanently removing any permitted land application site from service. Prior to commencing site closure activities, the permittee shall: a) participate in a pre-site closure meeting with the DEQ; b) develop a site closure plan that identifies specific closure or cleanup tasks with scheduled task completion dates in accordance with agreements made at the pre-site closure meeting; and c) submit the completed site closure plan to the DEQ for review and approval within forty-five (45) days of the pre-site closure meeting. The permittee must complete the DEQ approved site closure plan.

DRAFT

Appendix A: Annual Report Checklist

The WLAP LA-00004-02 Annual Report needs to contain (preferably in table form where possible) the following data and information for the calendar year covered by the report:

I. Wastewater Quantity:

- Monthly Treatment Plant Inflow from January to December in total gallons each month and total for the calendar year.
- Irrigation Application Volumes from May through October in total gallons each day and total for each month, the number of days each month used for irrigation, and total irrigation volume for the season.
- Monthly Discharge Volume from NPDES Discharge Monitoring Reports from January to the end of April and during December in gallons per month and total gallons for the calendar year.
- A wastewater inventory showing the volume of wastewater received at the facility, the amount land applied and discharged to Plummer Creek, and the estimated change in storage volume in the lagoons during the calendar year. Precipitation volumes per month from the Tensed weather station can be included.

II. Wastewater Quality:

- Wastewater sample results for COD, total N and Total P taken during each of the months of July and September.
- Calculation of the annual COD, Total N, and Total P loading rates per acre for the irrigation season.
- A table of the Total Coliform bacteria results and free chlorine measurements taken from the irrigation wastewater prior to application at least twice per month during the irrigation season months of May through October.

III. Crop Production:

- All results of water depth measurements from the three piezometers taken on the first of the months of May through October or as necessary to determine acceptable dry conditions (36-inches minimum) for irrigation practices to proceed.
- Identification of the acres used during the season for crop irrigation, the type of crop produced, the yield from the harvest, and the period of time during the irrigation season.
- A description of the cropping plan for the next growing season identifying the crop to be grown and the farmer contracted or hired by the city to manage the operation.

IV. Compliance Activities:

- In the Year 2002 Annual Report included Total Coliform, Nitrate, and a well log for the private well near the WLAP site.
- In the 2002 and 2003 Annual Reports, a summary of disinfection system improvements.
- In the year 2005 Annual Report include Total Coliform and Nitrate sampling results for any private wells sampled previously.

V. Certification:

- Signature and dating of the Annual Report by the system operator, the person who prepared the report and the Mayor of Plummer.

APPENDIX IX

2002 EPA Compliance Order

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue
Seattle, WA 98101

AUG 20 2002

Reply To
Attn Of: OW-133

RECEIVED 8/23/02

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Brian West, Council President
City of Plummer
P.O. Box B
Plummer, Idaho 83851

Re: Request for Information and Modified Compliance Order
Docket No. CWA-10-2002-0024

Dear Mr. West:

Enclosed is a Request for Information and Modified Compliance Order ("Modified Compliance Order") issued to the City of Plummer ("City") pursuant to Section 309(a) of the Clean Water Act, 33 U.S.C. §§ 1318 and 1319(a). EPA has adjusted the schedule in the Modified Compliance Order consistent with the information Wyatt Engineering, Inc. submitted on behalf of the City to EPA in a letter dated July 25, 2002.

Questions concerning these actions may be addressed to Robert Grandinetti at (206) 553-1283, or Cara Steiner-Riley, Assistant Regional Counsel, at (206) 553-1142.

Sincerely,

Tim Hamre for

Randall F. Smith
Director
Office of Water

Enclosure

cc: Gwen Fransen, Regional Administrator, IDEQ - Coeur d'Alene

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 10

In the matter of: City of Plummer Plummer, Idaho, Respondent.	)))))))	Docket No. CWA-10-2002-0024 REQUEST FOR INFORMATION AND MODIFIED COMPLIANCE ORDER

The following FINDINGS AND CONCLUSIONS are made and this REQUEST FOR INFORMATION AND MODIFIED COMPLIANCE ORDER ("Modified Compliance Order") is issued pursuant to the authority vested in the Administrator of the United States Environmental Protection Agency ("EPA") by Sections 308 and 309 of the Clean Water Act ("Act"), 33 U.S.C. §§ 1318 and 1319. This authority has been delegated to the Regional Administrator, EPA Region 10, and has been duly redelegated to the undersigned Director, Office of Water, EPA Region 10.

I. STATUTORY AUTHORITY AND FACTUAL BACKGROUND

1. Section 402 of the Act, 33 U.S.C. § 1342, provides that EPA may issue National Pollutant Discharge Elimination System ("NPDES") permits for the discharge of any pollutant into waters of the United States upon such specific terms and conditions as EPA may prescribe.

2. Section 301(a) of the Act, 33 U.S.C. § 1311(a), prohibits the discharge of any pollutant by any person except as authorized by an NPDES permit or other specified statutory sections.

3. City of Plummer ("Respondent") owns and operates a domestic wastewater treatment facility ("Facility") in Plummer, Idaho.

4. Respondent is a "person" within the meaning of Section 502(5) of the Act,

33 U.S.C. § 1362(5).

5. Respondent is authorized to discharge pollutants from the Facility under NPDES Permit No. ID-002278-1 ("Permit"). The Permit became effective on August 18, 1982, expired on August 18, 1987, and is currently administratively extended.

6. The Permit specifies the conditions under which the Respondent may discharge treated effluent from the Facility.

7. The Facility, which was under Respondent's control at all times relevant to this action, discharged "pollutants," within the meaning of Section 502(6) and (12) of the Act, 33 U.S.C. § 1362(6) and (12), from a "point source," within the meaning of Section 502(14) of the Act, 33 U.S.C. § 1362(14). Respondent discharged pollutants to Plummer Creek which is "waters of the United States," as defined in section 502(7) of the Act, 33 U.S.C. § 1362(7).

8. During the period from January 1998 to May 2001, the Facility exceeded the Permit's effluent limits for Biological Oxygen Demand ("BOD"), Total Suspended Solids ("TSS"), pH, BOD percent removal, and Suspended Solids ("SS") percent removal as detailed in Attachment A to this Modified Compliance Order.

9. **Respondent submitted a work plan to EPA on July 31, 2001**, and sent addenda on November 27, 2001 and February 26, 2002. The work plan and addenda detailed the work Respondent intended to perform to come into compliance with Respondent's Permit including replacing and repairing the Facility's collection system and constructing a new treatment facility.

10. EPA issued a Request for Information and Compliance Order to Respondent on April 26, 2002 alleging violations of Section 402(a) of the Act, 33 U.S.C. § 1342(a) and Section 301 of the Act, 33 U.S.C. § 1311(a). EPA ordered Respondent to come into compliance with the effluent limits specified in its Permit by January 1, 2004 by completing construction of the new treatment facility.

11. Wyatt Engineering, Inc., on behalf of Respondent, submitted new information to EPA in a letter dated July 25, 2002. The letter explained that Respondent would complete construction of its new treatment facility on January 1, 2007. Accordingly, EPA is modifying the original Request for Information and Compliance Order to reflect the new schedule.

II. ORDER

12. Based upon the foregoing FINDINGS, and pursuant to Sections 308 and 309 of the Act, 33 U.S.C. §§ 1318 and 1319, it is hereby ORDERED as follows:

13. Respondent shall eliminate inflow and infiltration into the collection system by December 31, 2004.

14. Respondent shall complete construction of its new treatment facility by January 1, 2007.

15. Respondent shall provide an annual report by December 31 each year this Modified Compliance Order is in effect detailing Respondent's compliance with the schedule set forth above.

16. In the event that the Respondent is unable to comply with any requirement of this Modified Compliance Order, Respondent shall, within ten (10) days of becoming aware of such inability, provide the following:

a. A summary of the specific reasons why Respondent is unable to comply with the requirement;

b. A summary of all actions taken by Respondent or others that Respondent allege demonstrate "good faith efforts" to comply with the requirement; and

c. The date by which Respondent expects to comply with the requirement.

17. Submittals required by this Request for Information and Modified Compliance Order shall be sent to:

U.S. Environmental Protection Agency
Region 10
1200 Sixth Avenue, OW-133
Seattle, Washington 98101
Attn: Robert Grandinetti

18. Pursuant to 40 C.F.R. §§ 2.201 - 2.311, Respondent may assert a business confidentiality claim covering any portion of the submitted information which is entitled to confidential treatment and which is not effluent data. For any such claim, describe the basis for the claim under the applicable regulation. Any material for which business confidentiality is claimed should be placed in a separate envelope labeled, "Confidential Business Information." Failure to assert a claim in the manner described in 40 C.F.R. § 2.203(b) allows EPA to release the submitted

information to the public without further notice. EPA may disclose information subject to the business confidentiality claim only to the extent set forth in the above-cited regulations. Special rules governing information obtained under the Act appear in 40 C.F.R. § 2.302.

19. Nothing in this Modified Compliance Order shall be construed to relieve Respondent of the requirement to obtain and comply with any NPDES permit or other applicable requirements of other federal, state, or local law. EPA reserves the right to take enforcement action as authorized by law for any violation of this Modified Compliance Order, and for any future or past violation of any permit or other applicable legal requirement.

III. SANCTIONS

20. Notice is hereby given that violation of, or failure to comply with, any of the provisions of the foregoing Modified Compliance Order may subject Respondent to (1) civil penalties of up to $27,500 per day for each violation, pursuant to Section 309(d) of the Act, 33 U.S.C. § 1319(d); (2) civil action in federal court for injunctive relief, pursuant to Section 309(b) of the Act, 33 U.S.S. § 1319(b); or (3) administrative penalties of up to $11,000 per day for each violation, pursuant to Section 309(g) of the Act, 33 U.S.C. § 1319(g).

Date this day 28th of August, 2002

Tim Hen... for
Randall F. Smith
Director
Office of Water

ATTACHMENT A

Date of DMR	Outfall Number	Permitted Parameter[1]	Permit Limit	Actual Discharge	Unit
Jan 98	001B	TSS	26	38.5	lb/day
Feb 98	001B	pH (daily maximum)	6.5	6.2	su
Feb 98	001B	BOD	85	77	% removal
Feb 98	001B	SS	85	70	% removal
Mar 98	001B	BOD	26	28	lb/day
Mar 98	001B	TSS	30	47	mg/l
Mar 98	001B	BOD	85	24	% removal
Mar 98	001B	SS	85	38	% removal
May 98	001B	BOD	85	68	% removal
May 98	001B	SS	85	68	% removal
Dec 98	001B	pH (daily maximum)	6.5	6.35	su
Dec 98	001B	TSS	26	29.5	lb/day
Dec 98	001B	TSS	30	31	mg/l
Dec 98	001B	SS	85	76.8	% removal
Jan 99	001B	BOD	85	82	% removal
Jan 99	001B	SS	85	79	% removal
Feb 99	001B	BOD	85	77	% removal
Feb 99	001B	SS	85	63	% removal
Mar 99	001B	BOD	85	58	% removal
Mar 99	001B	SS	85	56	% removal
Apr 99	001B	TSS	26	29	lb/day
Apr 99	001B	BOD	85	67.7	% removal
Apr 99	001B	SS	85	64.8	% removal
May 00	001B	SS	85	71	% removal

1/24

[1] Those not specified as daily maximums are monthly averages.

May 00	001B	SS	85	81	% removal
Feb 01	001B	SS	85	78	% removal
Mar 01	001B	BOD	26	37.98	lb/day
Mar 01	001B	TSS	26	55.24	lb/day
Mar 01	001B	TSS	30	32	mg/l
Mar 01	001B	BOD	85	56	% removal
Mar 01	001B	SS	85	44	% removal
May 01	001B	SS	85	84.5	% removal

21/32

APPENDIX X

Selected Correspondence

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue
Seattle, Washington 98101

MAR 05 1999

Reply To
Attn Of: OW-133

<u>CERTIFIED MAIL - RETURN RECEIPT REQUESTED</u>

2ND EPA WARNING LETTER

A.F. Booth, Plant Supervisor
City of Plummer
P.O. Box B
Plummer, Idaho 83851

Dear Mr. Booth:

On April 28, 1998, the U.S. Environmental Protection Agency (EPA) issued your facility a warning letter for violations of the Clean Water Act as result of your facility's noncompliance with its National Pollutant Discharge Elimination System (NPDES) permit (ID0022781). Since that warning letter, EPA has documented additional violations of the permit. The enclosed attachment provides the details of the violations.

Please be advised that continued violation may result in a formal enforcement action which may include monetary penalties. Clean Water Act violations can be subject to penalties of up to $27,500 per day for each violation. In such an event, in determining the appropriate penalty, EPA may consider all past violations including those listed in the attachment.

We urge your facility to take immediate corrective measures to ensure full compliance with its NPDES permit as well as all other applicable federal, state, and local requirements. Should you have any comments or questions regarding this letter, please contact Armina Nolan, or Robert Grandinetti, Compliance Officer's by phone at (206) 553-0530, or (206) 553-1283 respectively, or at the address above.

Sincerely,

LS Loiselle

LeRoy S. Loiselle, Manager
NPDES Compliance Unit

Enclosure

City of Plumme

P.O. BOX B
PLUMMER, ID 83851
PH. 208-686-1641

May 27, 1999

Mr. Robert Grandinetti
Mail Stop OW-133
US Environmental Protection Agency
1200 Sixth Avenue
Seattle, Washington 98101-1128

RE: Request for Information - NPDES Permit No. ID-002278-1 - City of Plummer

Dear Mr. Grandinetti,

We are pleased to offer the following response to your letter request of April 15, 1999:

1. The City has reviewed operation, maintenance, and sample testing data for the period January 1998 through February 1999 in order to determine probable causes for the violations listed on your enclosure.

Our review reveals the following:

a. January 1998 - TSS violation attributable to short circuiting of sand filters. Excessive flow attributed to I/I at a time aeration cells were full.
b. February 1998 - pH was low - no known cause and it has occurred only one other time. Low percent removal of BOD5 and TSS is attributed to sand filter short circuiting.
c. March 1998 - The violations of BOD5 and TSS are attributed to excessive I/I which skewed the percent removals and hydraulically overload the plant causing higher discharging of BOD and TSS.
d. May 1998 - Percent removals for BOD5 and TSS were skewed by low influent values caused by excessive I/I.
e. December 1998 - The low pH has only occurred one previous time and the cause is not known. TSS values are only marginally excessive.
f. January 1999 - Values were reported as follows:

Eff. BOD5	6 lbs./day	8 ppm
Eff. TSS	9 lbs./day	12 ppm
EFF. Fecal		<2 lbs./100 ml

The lower percent removal of BOD5 and TSS, although marginal, is attributed to the low value of influent caused by excessive I/I.

City of Plummer
P.O. BOX B
PLUMMER, ID 83851
PH. 208-686-1641

g. February 1999 - Values were reported as follows:

Eff. BOD5	6 lbs./day	7 ppm
Eff. TSS	8 lbs./day	14 ppm
Eff. Fecal		13 lbs./100 ml

The marginally lower percent of removals for BOD5 and TSS are attributable to low influent values caused by excessive I/I.

2. In 1995, the City launched a rehabilitation program to correct some of the system I/I, targeting the oldest section of the system. $362,500 was spent toward that goal. This amount was sufficient to complete only a portion of identified needs. the 1998/99 budget for the wastewater system O&M is $111,493 and includes $30,000 for system improvements.

3. Subsequent flow volumes at the treatment plant have confirmed that additional rehabilitation work will be required on the collection and transportation system. In March of 1999, the Indian Health Services agreed to assist the City with a study to evaluation "the condition and adequacy of the City of Plummer, Idaho, community wastewater collection, treatment, and disposal facilities." That report "identifies major system deficiencies, makes recommendations for corrections and provides alternatives with cost estimates for expansion...for future development..."

That report is expected in three (3) months and will serve to guide future programs for system improvements.

The City is evaluating some modifications to the pipe systems feeding the sand filters in an effort to reduce short circuiting and improve filter efficiency.

As a final attempt to address violations, the City, on May 10, 1999, submitted a proposal to Region 10 EPA Specialist Nickie Arnold in Boise, Idaho, requesting permit modifications to allow flow-based (in the receiving stream, Plummer Creek) discharge with a suggested 10:1 stream to wastewater ratio as an additional management tool for the City's wastewater system. Such a change would not reduce the need or intent to complete the aforementioned activities.

4. The studies to explore piping revisions in the sand filters and the I/I problems are not complete and cost estimating is premature at best.

City of Plummer

P.O. BOX 8
PLUMMER, ID 83851
PH. 208-686-1641

5. The studies should be complete on or about September 1, 1999, after which a timetable can be developed for any improvements.

6. The current permit expired August 17, 1987, and subsequent letters for renewal were last answered March 5, 1993, indicating that EPA was unable to process the application due to a backlog of higher priority requests.

The information contained in this response has been gleaned from City records and is accurate to our best information and belief. We are pleased to submit this information in response to your request and trust you will contact us if anything further is needed.

Sincerely,

Harold Whitley, Mayor
City of Plummer

c: Wyatt Engineering, Inc.

STATE OF IDAHO
DIVISION OF
ENVIRONMENTAL QUALITY

2110 Ironwood Parkway • Coeur d'Alene, Idaho 83814-2648 • (208) 769-1422

ic Rob Hardcastle

Dirk Kempthorne, Governor
C. Stephen Allred, Administrator

2/17/00

February 2, 2000

The Honorable Harold Whitley
Mayor, City of Plummer
P.O. Box B
Plummer, ID 83851

RE: 1999 Annual Report, Wastewater Land Application Permit (WLAP) LA-000004-01

Dear Mayor Whitley:

We have reviewed the Annual Report submitted by Albert "Corky" Booth on January 11, 2000 for the wastewater land application system serving the City of Plummer's wastewater treatment system. We would like to offer to you the following observations based on the report:

Infiltration/Inflow: First of all, we noted a dramatic decrease in flow into the treatment facility from 58.7 million gallons (MG) in 1998 to 42.5 MG last year. If this is the result of the recent work by the city to eliminate excessive inflow and infiltration (I/I), then we compliment the city on the success of these efforts.

As suggested by the city's recent work with consultants to continue to study the I/I problem, it appears the city has recognized that additional efforts are needed. Even with the recent flow reduction, the sewage treatment plant, which was designed for a capacity of 100,000 gallons per day (gpd), may be overloaded unless annual flows are kept below 36.5 MG.

DEQ would like to work with the city and your consultants on any proposals to re-construct the city's sewage collection system. DEQ is required by state law to approve plans and specifications for any modifications to your sewer or water systems.

Lagoon Seepage: The discrepancy in 1999 between the 30.8 MG of wastewater land applied (13.1 MG) or discharged to Plummer Creek (17.7 MG) and the 42.5 MG of wastewater received into the treatment lagoons is a concern. We suspect that the 11.7 MG of unaccounted for wastewater may have been lost to seepage out of the lagoon bottom.

Excessive seepage from the lagoons can adversely impact ground water quality. The city utilizes ground water to supply your drinking water system. We suggest that any studies of the city sewer system include an evaluation of lagoon seepage. When the lagoons were upgraded in 1980, they were lined with native material. A membrane liner should be installed if lagoon seepage is found to be excessive.

WLAP: We assume you are operating the land application system per the draft WLAP dated August 1, 1996. For some reason, a final permit was never issued for your facility.

The disinfection limit in this permit requires less than 230 total coliform organisms / 100 ml. in the applied wastewater. The bacteria reports submitted in the 1999 report indicated total coliform levels in many samples were greater than 1600 organisms/ 100 ml. The operator needs to increase the chlorine dosage or make other modifications to ensure disinfection levels are consistently less than 230 organisms/100 ml.

Crop: The report indicated that the irrigation oat crop was harvested on October 4, 1999 after land application had stopped on September 2, 1999. We shall assume that the purchaser of the oat crop was somehow informed that the oat crop was grown on land irrigated with reclaimed wastewater. If not, please make sure this type of information is provided to future purchasers of the crop harvested from the site.

NPDES: The city's proposal to have the NPDES discharge permit for this facility modified needs to be approved by the US Environmental Protection Agency (EPA). DEQ agrees with the proposal to allow a discharge to Plummer Creek whenever creek flows are in excess of 1.5 cfs and a 10:1 dilution is provided. We suggest that the city continue to request action by EPA in this matter.

Additional Irrigation Land: The need to provide additional land application area for the city has been discussed with DEQ for many years. City efforts to secure additional irrigation land is encouraged by DEQ. Please notify DEQ before you select any additional land for wastewater irrigation so that we can evaluate the suitability of the proposed site for land application and include the area in the WLAP.

Thank you for having this annual report submitted. DEQ will attempt to formally re-issue the city's WLAP during the next few months. In the meanwhile, we would like to be involved with the city and the Indian Health Service, Wyatt Engineering, and Idaho Rural Water Association in efforts to address wastewater system problem in Plummer.

Sincerely,

NLA

Gary J. Gaffney

Gary J. Gaffney, P.E.

c: Albert Booth, City of Plummer, P.O. Box B, Plummer, ID 83851
Richard Huddleston, DEQ-Boise
Donald Hutson, Indian Health Service, W. 904 Riverside Ave. Rm 408, Spokane, WA
Jeff Logan, Wyatt Engineering, Inc., 1220 North Howard, Spokane, WA 99201
Nickie Arnold, US E.P.A., ~~422 Washington Street,~~ Boise, ID 83702

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue
Seattle, Washington 98101

February 4, 2000

Honorable Harold Whitley
Mayor of Plummer
P.O. Box B
Plummer, Idaho 83851

Re: Wastewater Treatment Plant National Pollutant Discharge Elimination System (NPDES) Compliance Inspection

Dear Mayor Whitley,

January
On ~~August~~ 24, 2000 we conducted a NPDES compliance inspection of Plummer's sewage treatment plant. Enclosed is a copy of the report/checklist that summarize our findings. Although we did not take samples at the time of the inspection, the latest Discharge Monitoring Report for the period indicated the plant was in compliance with its permit.

However, in an April 15, 1999 letter, EPA requested information relating to previous discharge violations and the steps necessary to bring the facility back into compliance on a regular basis. The City responded in a May 27, 1999 letter outlining certain steps it was taking. Reference was made to an engineering study to be completed by September 1, 1999. It is our understanding that this study has not yet been completed.

We ask the City to immediately complete its study and propose a schedule that would return the plant to continued compliance and address the problems associated with excessive infiltration/inflow, the current land application site and the sand filters.

We extend our appreciation to Corky Booth, Plant Supervisor, for the assistance and courtesy shown us during the inspection. Mr. Booth appears to be doing the best possible job with the given situation.

If you have additional questions, please contact me in Boise at (208) 378-5754.

Sincerely,

Mike Silverman

Michael Silverman
Environmental Engineer

enclosures

cc: John Tindall, DEQ-CDA
Alfred Nomee, CDA Tribe

Printed on Recycled Paper

NPDES Water Compliance Inspection Report
City of Plummer (ID-0022781)

Facility Mailing Address: City of Plummer
P.O. Box B
Plummer, Idaho 83851

Inspection Date: January 24, 2000

Report Date: January 27, 2000

Contact: A.F. (Corky) Booth, Plant Supervisor; (208) 686-1386

Authorized representative: Honorable Mayor Harold Whitley

Those Present at the Inspection: Corky Booth, Plant Supervisor
Scott Fields, CDA Tribe
Mike Silverman, EPA-IOO

Facility Description: Headworks comprised of a grinder, parshall flume, sonic flow totalizer; two aerated lagoon cells; chlorination; two sand filters; and discharge in winter to Plummer Creek and in the summer to a 27 acre land application system.

Date of last previous inspection: unknown

Findings/Items to follow up on:

- The plant is subject to high I/I flows--at times in excess of 400,000 gpd. It is also in need of modifications and/or expansion. There are plans to acquire a new 80 acres land application site. The site is upland and more suitable than the current lowland site which is subject to drainage and tight clay soil problems that often prevent its early season use.

  EPA has sent the City two letters noting various effluent limit violations. In a May 27, 1999 letter responding to EPA's enforcement letter of April 15, 1999, the City noted that a study was underway intending to identify the plant's problems and schedule steps for achieving compliance. The study was to be complete by September 1, 1999. The study had not yet been completed at the time of the inspection.

  The City needs to immediately complete this engineering study and establish a schedule for achieving compliance.

- Problems exist with the mode of operation and performance of the existing sand filters.

- Although no samples were taken at the time of the inspection, the DMR for the most recent time period showed removal rates of 95% and 96% for BOD and TSS respectively.

Entry and Credentials

<u>yes</u> | no | n/a Showed credentials upon entry
<u>yes</u> | no | n/a Contacted person in charge - Corky Booth, Plant Supervisor

Records and Reports

<u>yes</u> | no | n/a Records and reports maintained as required by permit.
<u>yes</u> | no | n/a Permit on file at facility
<u>yes</u> | no | n/a Sampling date, time, location, person
<u>yes</u> | no | n/a Analyses dates, time, person-- **BOD, fecals, and TSS are analyzed by the Idaho State Lab in CDA on a contract basis.**
<u>yes</u> | no | n/a Analytical methods used - Standard Methods
<u>yes</u> | no | n/a Results (consistent with DMRs)
<u>yes</u> | no | n/a Monitoring records kept for minimum 3 years

Permit Verification

<u>yes</u> | no | n/a Inspection observations verify the permit
<u>yes</u> | no | n/a Correct name and mailing address
<u>yes</u> | no | n/a Facility is as described in permit
yes | no | <u>n/a</u> Principal products and rates as set forth in permit application **(municipality)**
<u>yes</u> | no | n/a Treatment processes are as described in application
yes | no | <u>n/a</u> Notification given of new, different or increased discharges
<u>yes</u> | no | n/a Accurate records of raw water volume maintained--**Sonic flow totalizer at headworks measures flow and is periodically calibrated against parshall flume.**
<u>yes</u> | no | n/a Number and location of discharge points as described in permit
<u>yes</u> | no | n/a Correct name and location of receiving waters

Operation and Maintenance

<u>yes</u> | no | n/a Treatment facility properly operated and maintained
yes | <u>no</u> | n/a Standby power or other equivalent provisions provided–**No major lift station at plant--if power goes out, aerators and chlorinator will go down--one small lift station in collection system serves only a few connections.**
<u>yes</u> | no | n/a Adequate alarm system for power or equipment failures available
yes | no | <u>n/a</u> Sludge management plan and disposal sites approved
<u>yes</u> | no | n/a All treatment units in service
<u>yes</u> | no | n/a Established procedures available for training new operators
<u>yes</u> | no | n/a Adequate number of qualified operators--**1 operator; OK**
yes | <u>no</u> | n/a Files maintained on spare parts, equipment specifications, suppliers–
<u>yes</u> | no | n/a Maintenance record system adequate
<u>yes</u> | no | n/a Operation and maintenance manual maintained
yes | no | <u>n/a</u> EPA /State notified of diversions
yes | <u>no</u> | n/a Any bypassing since last inspection
<u>yes</u> | no | n/a Any hydraulic or organic overloads experienced--**Periodic I/I hydraulic problems-- see above comment**

Safety items satisfactory

yes | no | n/a Adequate storage of fuels, chemicals, oil

yes | no | n/a Personal protective clothing provided: helmets, ear protectors, goggles, gloves, rubber boots with steel toes, eyewashes, pipette suction bulbs, fume hood, shower

yes | no | n/a Safety devices available: fire extinguishers, oxygen deficiency/explosive gas indicator, safety harness, first aid kits, ladder to enter manholes or wetwells, traffic control cones, safety buoys, life preservers

yes | no | n/a General safety structures: rails, covers

yes | no | n/a Plant personnel immunized for typhoid and tetanus

yes | no | n/a No cross connections, backflow preventer properly installed and tested--**No potable water at plant.**

yes | no | n/a Chlorine safety: approved air pack, chlorine cylinders chained, personnel trained in the use of chlorine, repair kit available, leak detector tied into plant alarm system, ventilation fan with outside switch, posted safety precautions.

yes | no | n/a Facility has complied with the 6 employer responsibilities for the Worker Right-to-Know Law

yes | no | n/a Emergency action plan and phone numbers

yes | no | n/a Warning signs: no smoking high voltage, non-potable water, chlorine hazard, watch your step, and exits

Compliance Schedules

yes | no | n/a Permitted is meeting compliance schedule--**Need to develop a compliance schedule**

Self-Monitoring Program

yes | no | n/a Flow measurement meets the requirements and intent of the permit-- **an instantaneous flow measurement is taken once per day from reading an effluent weir; this data is used to calculate DMR (lbs./day/ and % removal) information.**

yes | no | n/a Influent flow meter properly installed, operated, calibrated, maintained
Describe flow meter: **parshall flume, sonic transducer flow totalizer**

yes | no | n/a Effluent flow meter properly installed, operated, calibrated, maintained
Describe flow meter: parshall flume, sonic transducer

yes | no | n/a Sampling meets the requirements and intent of the permit.

yes | no | n/a Locations adequate for representative samples

yes | no | n/a Parameters and sampling frequency agree with permit.

yes | no | n/a Permitted is using method of sample collection and handling as required by permit and approved procedures

yes | no | n/a Flow proportioned samples obtained where required by permit

yes | no | n/a Sample holding times in conformance with 40 CFR 136.3

yes | no | n/a Monitoring and analyses being performed more frequently than required by permit

yes | no | n/a If yes, are results reported in permitted's DMR

Laboratory

yes | no | n/a Permitted lab procedures meet the requirements and intent of the permit
yes | no | n/a Approved QA/QC--**City uses State Lab on a contractual basis**
yes | no | n/a EPA approved analytical testing procedures used
yes | no | **n/a** If alternate procedures are used, proper approval obtained
yes | no | n/a Adequate calibration and maintenance of instruments and equipment
yes | no | n/a Duplicate samples are analyzed % of time
yes | no | n/a Spiked samples are used % of time
yes | no | n/a Quality control procedures used
yes | no | n/a Commercial laboratory used--**City uses State Lab on a contractual basis**
yes | no | n/a Commercial laboratory certified--**City uses State Lab on a contractual basis**

Effluent/Receiving Water Observations

yes | no | n/a Outfall inspected: no oil, grease, turbidity, foam, solids, etc. found

Sampling Inspection Procedures and Observations

yes | no | n/a Grab Samples obtained
yes | no | **n/a** Composite obtained
yes | no | **n/a** Flow proportioned sample
yes | **no** | n/a Automatic sampler used
yes | **no** | n/a Sample split with permitted
yes | **no** | n/a Sample obtained from facility sampling device
yes | no | n/a Sample representative of volume and nature of discharge

Other Comments and/or Observations: see attached letter

Inspector(s): Mike Silverman EPA-IOO (208) 378-5754

M. Silverman

Signature

EPA

Environmental Protection Agency
Washington, D.C.

OMB No. 2040-0057

WATER COMPLIANCE INSPECTION REPORT

Section A: National Data System Coding (i.e., PCS)

Transaction Code	Type	NPDES	yr/mo/day	Inspection Type	Inspector	Fac Type
1) N	2) 5	3)ID002278-1(11)	12)00/01/24(17)	18)C	19)R	20)1

21)____(66)

Inspection Work Days	Facility Self-Monitoring Evaluation Rating	B1	QA	Reserved
67) 5.0(69)	70) 5	71)N	72)N	73)_(74) 75)___(80)

Section B: Facility Data

Name and Location of Facility Inspected (For industrial users discharging to POTW, also include POTW name and NPDES number):

City of Plummer Sewage Treatment Plant
P.O. Box B
Plummer, Idaho 83851

Entry Time/Date:11:00;01/24/00
Permit Effective Date:07/18/82
Exit Time/Date13:30;01/24/00
Permit Expiration Date:08/17/87 extended

Name(s) of On-Site Representative(s)/Title(s)/Phone and Fax Number(s)
A.F.(Corky) Booth, Plant Supervisor (208) 686-1386

Other Facility Data

Name, Address of Responsible Official/Title/Phone and Fax No.
Contacted Yes__ No X
Honorable Mayor Harold Whitley, Plummer, ID 83851; (208) 686-1641

Section C: Areas Evaluated During Inspection (Check only those areas evaluated)

X Permit
X Records/Reports
X Facility Site Review
X Effluent/Receiving Waters
X Flow Measurement
X Self-Monitoring Program
_ Compliance Schedules
X Laboratory
X Operations & Maintenance
X Sludge Handling/Disposal
_ Pretreatment
_ Storm Water
_ CSO/SSO (Sewer Overflow)
_ Pollution Prevention
_ Multimedia
_ Other:

Section D: Summary of Findings/Comments (Attach additional sheets of narrative and checklists as necessary)

See attached letter.

Name(s) and Signature(s) of Inspector(s)	Agency/Office/Phone and Fax Numbers	Date
[signature]	EPA-IOO; (208) 378-5754; FAX 378-5744	2/3/00
Signature of Management Q A Reviewer	**Agency/Office/Phone and Fax Numbers**	**Date**

City of Plummer

P.O. BOX B
PLUMMER, ID 83851
PH. 208-686-1641

August 22, 2001

Wally Hubbard
CDA Tribal Planning & Development Corp
S 30001 Highway 95
Worley, Idaho 83876

Dear Wally,

On August 9, 2001 the Plummer City Council took action to lift the moratorium on sewer connections once a letter was received assuring that an administrative order would be issued by EPA. This letter has arrived and I am happy to announce that the moratorium is officially lifted at this time.

The administrative order is based on the time line we supplied to EPA showing work that will be accomplished to reduce the storm water flow into the sewer plant. The City must follow through with this action to avoid being under the threat of fines again.

Step one of several is complete. Progress is back on track in Plummer, Idaho. Thank you.

Sincerely,

Donna Spier

Donna Spier
City Clerk

Cc: Mary Miner, IHS
Marcus Marinez, IHS
Jeff Logan, Wyatt Engineering

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue
Seattle, WA 98101

APR 29 2002

Reply To
Attn Of: OW-133

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Brian West, Council President
City of Plummer
P.O. Box B
Plummer, Idaho 83851

Re: Compliance Order
Docket No. CWA-10-2002-0024

Dear Mr. West:

Enclosed is a Request for Information and Compliance Order ("Order") issued to the City of Plummer ("City") pursuant to Section 309(a) of the Clean Water Act, 33 U.S.C. §§ 1318 and 1319(a).

The Order provides a schedule for the City to come into full compliance with the NPDES Permit ID0020184. The Order also provides a requirement to submit annual reports detailing the City's compliance with this Order.

Questions concerning these actions may be addressed to Robert Grandinetti at (206) 553-1283, or Cara Steiner-Riley, Assistant Regional Counsel, at (206) 553-1142.

Sincerely,

Randall F. Smith

Randall F. Smith
Director
Office of Water

Enclosure

cc: Gwen Fransen, Regional Administrator, IDEQ - Coeur d'Alene

City of Plummer

P.O. BOX B
PLUMMER, ID 83851
PH. 208-686-1641

May 6, 2002

Jeff Logan
Wyatt Engineering
1220 N Howard
Spokane, Washington 99201

Dear Jeff,

We have received our Compliance Order from EPA for our NPDES Permit. A copy is enclosed for your review and records.

I am also enclosing a copy of the Draft Wastewater Land Application Permit from DEQ. You may already have this permit. Mr. Gaffney is requesting comments prior to May 31st. Your review and comments would be appreciated. I have included a few questions of my own that I think the Council may be interested in. Both of these documents will be reviewed by the City Council at their meeting this week. Thank you.

Sincerely,

Donna Spier
City Clerk

Alan Gay

From: Scott Fields [sffields@cdatribe.com]
Sent: Wednesday, September 11, 2002 8:52 AM
To: Alan Gay
Cc: Alfred M. Nomee
Subject: RE: Plummer Creek Water Quality Standards

Alan,. I agree that your synopsis provided below is a accurate description of the issues we discussed this morning I must add though that those are my initial findings on this matter and they may change with further analysis.
Thanks
Scott.

-----Original Message-----
From: Alan Gay [mailto:AGay@uskh.com]
Sent: Wednesday, September 11, 2002 8:43 AM
To: Scott Fields
Subject: Plummer Creek Water Quality Standards

Scott:
To reitterate our phone conversation of this morning, I'm emailling you regarding what I percieve we agreed upon. If you would please respond when you are able if you agree with my interpretation (or what you take exception to if you don't)I would very much appreciate it.

Based on the spreadsheet that I emailed to you yesterday (PlummerCrk wq projection.xls, dated 9/10/02, time 10:21 am), you said the numbers look pretty good. You also said that you had concern about the low flow discharge ratios. I responded that our design (though not the above-noted spreadsheet) incorporates an equalization basin and controls on the discharge rate that will allow us to flow-pace the discharge from the Plummer WWTP at 10% or less of Plummer creek streamflow. Your reply was that this approach was acceptable.

You also questioned the chlorine limit included below. I responded that this figure was only included to indicate the low chlorine residual necessary based on comparable waters, and that we will be using either UV or ozone disinfection in the future plant.

Following are the water quality parameters (as before) that we are proposing for the Plummer WWTP once the plant improvements are completed by January, 2007:

BOD: 30 mg/L maximum weekly average, 20 mg/L maximum monthly average
TSS: 30 mg/L maximum weekly average, 20 mg/L maximum monthly average
DO: 6 mg/L minimum
pH: between 6 and 8
Total Phosphorus: 0.50 mg/L maximum weekly average, 0.25 mg/L maximum monthly average
Total Coliform: 200 count/100 mL, by geometric mean
Chlorine: 0.1 mg/L

Once again, I look forward to your reply, and I greatly appreciate your assistance in resolving this matter.
Thanks,
Alan Gay